LESSONS IN PSYCHOLOGY

HANNAHS

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PREFACE

THE lessons are designed particularly for the use of teachers and those who are studying to be teachers. The principles of psychology, however, as here presented show the bearing of the subject in the affairs of daily life, and for this reason it is hoped that the book will be of interest as well to others.

Though it has not been customary to follow the plan of the Lesson-Unit in teaching above the grades, I have ventured to arrange my material according to it, since that material is for the most part elementary. And long experience has confirmed my opinion that it is helpful in all work in the classroom to follow in spirit, at least, each day the general plan of the three steps of preparation, presentation, and application.

In using the lessons in the classroom teachers will find many of them as given too long for one day's work. A week is not too much time to spend in reaching, for example, the law of associations here developed in the first lesson. For the formulation of this law pupils will be interested to trace in class and outside many trains of association and to talk about them familiarly as they do about the facts of nature or mathematics. And in most of the subjects, indeed, pupils may spend profitably a much longer time than one lesson in watching, giving, and discussing their experience before they are led to generalize.

A great amount of practice is necessary, moreover, to accustom one's self, say, to trace trains of association, to find first members, to realize when one has omitted members,—in short, to become really familiar with the process of watching the stream of thought from the standpoint of

associations and to establish the habit of observation. The lessons are quite without meaning unless this detailed observation is persistently continued.

Psychology to be of value to a teacher or to any one else must be a habit of mind. Such a knowledge as one gains in reading a technical book on the subject when one says of a fact, " Yes; that is true; I'll remember it," might be called an assenting knowledge. A few facts gained in this way no doubt become available in guiding daily life, but not a large enough number to pay for the time spent in this mode of study.

If, on the other hand, a person sets earnestly to work to master his own thought processes, the ways of his mind, he will soon accumulate a mass of observations, which indeed " are not in themselves science, but without which there is no science " for him. The kind of knowledge of psychology that he can make out of this material is the kind that is valuable, the kind that is available daily and hourly in the schoolroom and everywhere. It is not just formal, academic information about a text-book, it is rather knowledge of the subject in our hearts and lives—willed, professional wisdom.

The lessons are offered then, not with the aim to present theories of psychology, nor yet to record the progress that has been made in the science. There has been no attempt even to classify the material logically. The purpose of the book is rather to indicate one way in which by the study of his own experience a person may gain a working idea of some of the simple, general, and commonly accepted truths of mind.

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Lessons in Psychology

CHAPTER I

ASSOCIATIONS

LESSON I

THE LAW OF ASSOCIATIONS

PREPARATION STEP.—I. There is no better place to begin the study of psychology than your own mind, and no better method to follow than that of constant observation of what takes place there. Suppose then that you study your stream of thought, say, from the standpoint of the law of associations.

II. Surely you have noticed occasional trains of association. To gain a working idea, however, of the law, you must make a business of watching what passes through your mind. For convenience in analyzing it, regard your stream of consciousness as though it were all made up of successive trains of associations, each one interrupting the preceding one, and trace, trace, trace your fleeting thoughts morning, noon, and night!

III. After having observed these trains of associations for a time, begin to write out lists of them. Recall the ideas that have helped to make your stream of thought for the last half hour and write them out somewhat in this way: (I just looked to see what time it was.)

(1.) A visual image of the clock-face;
(2. Thought words) Eight o'clock; I must do my errands;

(3.) A secondary (recalled) visual image of a shop I must visit.

Another series:

(1.) Temperature sensations of hot coffee in my mouth and throat;
(2. Thought words) How good this hot coffee is!
(3. Thought words) It is such a luxury to have it hot.

A third series:

(1.) Organic sensations in my lungs;
(2. Thought words) This room is very close;
(3. Thought words) I'll open the window;
(4.) Group of secondary (recalled, inner) muscular sensations making the idea of myself as turning and opening the window.

A fourth series:

(1.) A group of sound sensations;
(2. Thought words) Miss S. is opening the door;
(3.) Group of secondary color sensations making an image of Miss S. opening the door;
(4. Thought words) She always opens the door so gently.

Trace in this way twenty trains of association an hour.

IV. For convenience in tracing your thoughts count each outer experience as No. 1. Almost always No. 2 will be thought words naming, or identifying No. 1. Then may follow secondary visual images or images in the terms of any sense or more thought words. We may have any number almost of trains of association on the same subject, and also

we may change the subject in each successive member of a train of associations. You will notice, moreover, that sometimes the series are very long, sometimes so short and quick, so fleeting that they hardly seem to have been in consciousness at all.

V. What the relation is between brain and mind nobody has ever determined. It seems certain that when thoughts are in the mind the blood is circulating in the brain, and for given thoughts in consciousness the same part of the brain apparently is always flushed and stimulated. Do you remember the appearance in the sky of the *aurora borealis*? A recent writer has likened to the motion of this flitting, quivering light the shimmer and play of the activity of blood in the brain and of its accompanying mentality, one as subtle as the other. But though the relation between brain and mind cannot be explained, one must realize that the sensation blue is different from the vibration of brain-cells, that a mental state is different from the activity of matter.

PRESENTATION STEP.—I. When we examine the parts of one of these trains of association we are led to the question, why should one group of sensations follow another? Why, for example, should a certain group of color sensations which makes the clock face be followed by the thought words, It is eight o'clock? Why did I not think instead, It rains, or China?

The reason seems to be that sometime in the past I have had this certain grouping of color sensations in my mind before with the thought words, It is eight o'clock. Sometime before, also, I had thought, At eight o'clock I shall go out to do some errands. So now that I think, Eight o'clock, the thought follows, I must do my errands. And as I examine the members two and two of my trains of association, I find in each case that some or all of the ele-

ments composing them have been in my mind together before; I have been conscious of them as near in previous time relations.

The law of associations then is, Mental elements that have been together in mind before will return together when some of them return, or, "When part of an idea appears in consciousness, the whole appears."

II. Whatever other relations may be superadded, all thought seems to be governed by this law. But though stated in the terms of ideas, the law is really a description of the way in which the elements of the brain and the body are stimulated and respond. As Professor Titchener says, "When two or three parts of the brain have been excited together, in perception, a habit of co-excitation or joint excitation is set up; so that if, later on, one of the parts is excited alone the others will be involved also,—and involved the more certainly, the more habitual the connection has been in perception."

The law is fundamentally one governing bodily elements, the Law of Habit.

APPLICATION STEP.—I. Watch your thoughts constantly; jot down lists and think the law of associations with each list. You cannot do this work by accident—you have to think about it and make an effort to do it.

II. Watch different people to see how different their response is under apparently the same stimulus. Watch evidences of associations in children as shown in their speech and acts. Watch animals to see to what extent they are governed by the law of associations.

III. In sleep the minimum of blood is sent to the brain and the mind is least active. We have not so many associations, "we are only a fraction of ourselves." Trace the associations in dreams.

IV. Observe associations in conversations that you carry on and overhear. How much could you understand or say if it were not for associations?

V. In the terms of associations, what is the process of reading? Is it not the process of having trains of association, the first member of each of which is a visual image of one or more script or printed words? There is no thought in a book, surely, no mental states like those in a mind—"All we get from a book is what we bring to it" arranged in new relations.

VI. Think over the gifts or photographs you have given to friends lately. From the standpoint of associations, why did you give them?

VII. Observe the kind of sensations that make up the members of the trains of association. Are there visual images, or groups of color sensations—so many that you think habitually in the terms of sight? In other words, are you eye-minded? Or do you think more often in thought words, that is, groups of secondary sound or touch sensations? Determine whether your type is visual, auditory, or tactual.

LESSON II

A STUDY OF IDENTICAL ELEMENTS IN TRAINS OF ASSOCIATION

PREPARATION STEP.—I. There will be suggestions for our work in the schematic representation of the associations between mental states. Let us picture these relations.

II. Recall and write lists of trains of association that you have had to-day about the weather, the temperature, the appearance of the sky, of the mountains; those that you have thought about your meals, your food; those starting in aches and pains, in hunger and thirst; those that you have noticed in connection with conversations.

III. Write lists of the sensations that make up each member of the trains of associations: For example,

(1. Sound sensations,)
- noisy,
- crunching (made by wheels on snow),
- creaking,
- squeaking,
- loud sounds,
- high pitched;

(2. Thought words,) How cold it must be!
- Words incipiently spoken in the terms of the muscles of the throat and tongue;

(3. Secondary visual image,)
- Grays,
- reds,
- browns (so grouped as to form the snow-covered street).

and so on, for many trains.

IV. What do you mean when you say that A's portrait is a good likeness, that it looks like his face?

The face, to you, is really a group of color sensations arranged, or grouped in a definite way; the portrait also is a group of color sensations combined as nearly as the artist can combine them in the same way that the similar colors are grouped to make A's face. There are certain colors and arrangements that are identical in your mind to the two. In an oil painting, for example, there are probably both colors and arrangements that are common to face and portrait. In a blue-print, on the other hand, there are no colors in common, but the arrangement of blues may have so much that is identical with the arrangement of colors in the face that it is an excellent likeness.

When we say that two different people resemble each other, we really mean that their faces, reduced to color elements and grouping, have certain points in common, certain sensations or arrangements that are identical.

And so it is with all experiences that we call similar. All similarity reduces to few or many identical elements among diverse elements.

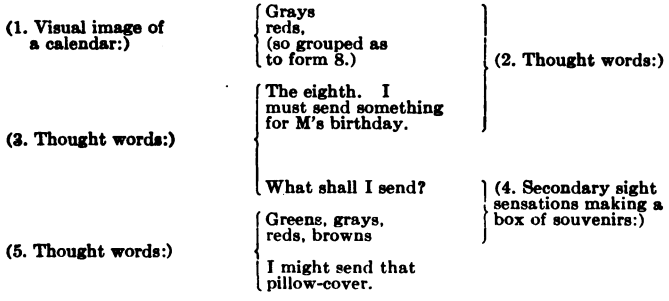
PRESENTATION STEP.—I. Write (*a*) the lists and (*b*) the elements for several trains of association somewhat as follows:

(*a*) List:

(1.)	Visual image of a calendar;
(2. Thought words)	The eighth; I must send something for M's birthday;
(3.)	What shall I send?
(4.)	Secondary visual image of a box of souvenirs;
(5.)	I might send that pillow-cover.

(*b*) The elements of this list in the order and relation that they came to my mind are:

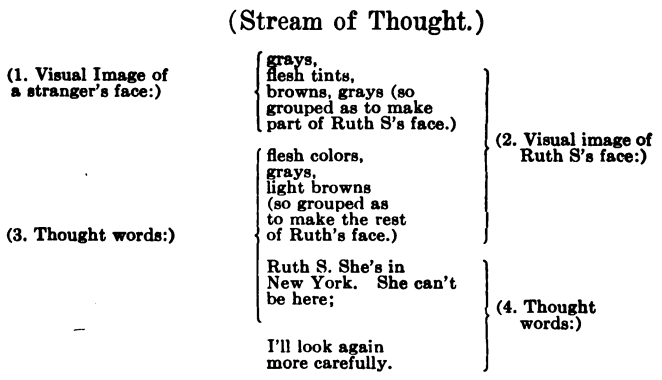
(Stream of Thought.)



That is, I have now in mind as a primary experience a visual image of a calendar. This image is composed of grays so grouped as to form a figure eight. When I have had that grouping in mind before it was part of another mental state which was then completed by the thought words, " The eighth, I must send something for M's birthday." The thought of sending a gift had before been in my mind as part of another mental state which was then completed by the thought of deciding what I should send. So that now when I think, " I must send something," the thought follows, " What shall I send?" and so on.

The elements identical to two mental states are pictured as common to two braces.

II. A second graphic analysis:



In the above series I saw a stranger whose face resembled Ruth S's face, that is, had elements in common with it. When I saw the first face, " quick as thought " Ruth's face flashed into my mind with the thoughts that followed.

III. A third graphic analysis:

(Stream of Thought.)

(1. Sound sensations:) { noisy, loud, high in pitch, crunching, creaking, squeaking; } (2. Thought words:)

(3. Secondary visual image of the snowy street:) { How cold it must be! Grays, reds, browns. }

IV. Each train of associations reduces to the general formula,

(1.) { a, b } (2.)

(3.) { c, d, e } (4.)

and so on.

The thoughts b, c, d, e, are the results in mind of the excitation of the brain cells b′, c′, d′, e′. The excitation of the brain cells follows the path established by the law of habit.

APPLICATION STEP.—I. This plan of tracing and analyzing trains of association leads to closer observation of thoughts than that followed in the first lesson. By that plan members and elements may often be omitted or overlooked. By studying out always the elements of identity between each two groups, one finds a larger number of thoughts and thus learns more about his mind.

II. Professor Titchener calls these identical elements "stepping stones," as it is by means of them that we pass from one idea to another. Thomas Hobbes, a great English philosopher, showed that it is by these common elements that we may "perceive the way of this wild ranging

of the mind, and the dependence of one thought upon another."

III. I may have had a hundred or more visual images of the capitol. But though I speak of them all as "the capitol," each one differs in some details from all the others. I do not think the same thoughts after any two of them. Each different visual image that I call "the capitol" has elements that have been in my mind before with thought words,—sometimes, perhaps, with "the east front;" again with, "How badly discolored the south walls are!" And still again with, "I must return that book to the capitol library," and so on. In each case the elements making the different visual images of the capitol had been in my mind before with the thought words that followed. Graphically I thought,

(1. Visual image of the capitol,)	grays, (grouped to make the east front.)	(2. Thought words,)
	The east front	
or,		
(1. Visual image of the capitol,)	grays, (grouped to make the discolored south side,)	(2. Thought words;)
	The south side is badly discolored	
or,		
(1. Visual image of the capitol,)	grays, (grouped to make the library windows.)	(2. Thought words,)
	I must return that book to the capitol library.	

IV. We have, in other words, what might be called multiple associations with the capitol, and not only with the capitol but with many, many other facts, people, and experiences of all kinds.

The business of education may be regarded as to develop proper multiple associations. Study each day's lesson

that you teach with the idea of establishing the material in many trains of association, of " multiplying cues."

V. What is the explanation of forgetting, say, a person's name? Is it not that we cannot recall a thought having elements identical with the mental state of which the name forms a part, that we cannot get on the right train of association? In other words we cannot come upon a thought that has been in mind before with the name.

In our endeavor to find an identical element we go over the alphabet, recall the scenes and circumstances of meeting the person and all we know about him. Then perhaps an hour later, when we are thinking apparently of something wholly different, we come upon the identical element, and there is the name! As the witty woman in " Dr. North and his Friends " said, our thoughts are like Bo-Peep's sheep. " Let 'em alone and they'll come home, a-bringin' their tales behind them."

VI. It is convenient in observing and analyzing our thoughts to speak of them as though they were separate entities, just as we think of the separate atoms of matter, Our stream of thought, however, is not broken or divided into units, it is itself a unit; as Professor James says, " Thought is not jointed, it flows."

VII. I must urge you to persevere in the practice of tracing trains of association and, also, artificial as it may seem at first, in seeking the identical elements between their different members. There is no kind of observation and study that shows us so much about our mind as this study of associations. If you were learning botany you would not find it trivial or irksome to analyze many plants minutely. Put the same amount of effort and patience in this work.

LESSON III

ANALYSIS OF ASSOCIATIONS

PREPARATION STEP.—I. By describing and making explicit the condition and process which make possible your present thoughts you can vary your observation of associations.

II. Recall trains of association that you have had about music heard recently; about people's voices, sounds in the street, in the house. Recall what you have thought while reading newspapers, magazines, signs, bill-boards, letters; on seeing pictures, buildings, landscape, a river, a hill, a tree, a head, a face, mannerisms, expressions, gestures.

Watch the association of acts with thoughts; as, (1.) Visual image of a letter; (2.) I must mail that letter; (3.) I'll put it where I can see it when I go out; (4.) Secondary muscular sensations of placing the letter on the desk. (1.) Primary muscular sensations of rising; (2.) Secondary muscular sensations of reaching out my hand and placing the letter on the desk. (1.) Smell sensations of smoke; (2.) What can be burning? (3.) I'll see. (1.) Muscular sensations of rising; (2.) I'll look in the outer hall first,—and so on.

III. Do you remember the first time you saw moving pictures? An automobile? An electric launch? Recall your first experience in hearing a phonograph, a pianola, a telharmonium.

How did you identify these experiences? Did not some one have to tell you what each one was? Or, had you not read about a pianola, for example, picturing as you read how it would look and sound, so that when you saw something that looked like the picture you could think the word with the image again?

PRESENTATION STEP.—I. Write (*a*) the list and (*b*) the schematic analysis of several series. For example,

(*a*) (1.) Sound sensations of wheels creaking in the snow;
(2. Thought words:) How cold it must be!
(3.) Secondary visual image, the frosty street outside.

(*b*) (1.) { noisy sounds, crunching, creaking, loud, high in pitch, squeaking; } (2. Thought words:)

(3.) { How cold it must be!
grays,
reds,
browns. }

II. To make explicit the process by which it is possible for me to have these thoughts:

Long ago in my childhood and many times since, I remember to have heard this peculiar creaking, crunching sound of wheels in the snow when I have heard some one say and have thought, How cold it must be! Now that I hear sounds of this peculiar quality again, I think (not, red chimneys, nor anything else, but just the thought that has been with this peculiar quality of sound before) How cold it must be! When I have thought, How cold it must be! before, I have seen the street as it looks on a frosty morning. So now that I think the words, How cold it must be! they are at once followed by a secondary visual image of the frosty street.

III. Again, I have the series, (1. A song in parts) musical sounds; (2.) Incipient humming of one of the parts

with the singer; (3. Thought words) This humming is what listening is. I'm listening to one part.

I once learned that the process of hearing sounds, of listening is one of incipiently imitating the sounds in the throat. When I heard one part of the musical sounds, I incipiently reproduced the sounds in my throat; When I had had the thought of hearing that voice before at a certain time I had thought, I'll listen to it; so now that I hum to myself with the voice, I think, This humming is listening. I'm listening to one part.

IV. Analyze thus many trains of association explaining with each two members that it is possible for them to come back together *now* because they have been together *before* and recall if possible the certain definite time when they were together formerly.

APPLICATION STEP.—I. Think out associations in which you image different acts. The thoughts, for example, of the words that I am to write are followed by inconceivably fleeting secondary groups of touch, muscular, and joint sensations that make before I write each word the image of my act in writing. These associations were established when I learned to write.

II. Our muscles perform many acts for us as a result of established bodily associations, or habit, without conscious direction or with only a little thought. Watch these bodily associations constantly.

III. What have you thought recently on seeing a flag? A steeple? College colors? Recall the time when these associations were established.

IV. Why build church steeples? What do they mean? Why put out flags? Of what value would a visible symbol be if nobody had any associations with it?

V. If there were no visible signs, monuments, memorials of people, events, and ideals, from the standpoint of associations what should we miss?

VI. What is the value of associations to us emotionally and as related to interests?

VII. What difference does the work of Burns, Scott, and Carlyle make in our interest in Scotland? What associations have writers added to places in our own country? What associations has history established around places and people that you know?

VIII. "The man who, from poverty of mental background, is stirred by none of these things" (associations that come on a visit to the homes of Milton, Wordsworth, and Shakespeare, to Stirling Castle,) "misses an influence on character and a stimulus to conduct which are of incalculable value. A soldier whom I met some time ago told me that, when he was a young subaltern, and was getting slack, as he expressed it, he was pulled together by a pithy but effective remark of his superior officer. 'Take care,' he said: 'you're forgetting Wellington, and the history and traditions of the army.' There's many a lad who has been spurred to his best endeavor and restrained from a mean or ignoble act, by the flashing across his mind of the name and figure of one of his heroes in history or in fiction." ("Psychology for Teachers," C. Lloyd Morgan.)

LESSON IV

CORRELATIONS

PREPARATION STEP.—I. The law of habit governs the way in which our thoughts come back always. There is often, moreover, besides the relationship of mere contiguity, or nearness between mental states, another relation superadded.

II. The following lists will serve to illustrate this kind of relation:

a. (1.) Smell sensations;
(2. Thought word) perfumery;
(3.) Where does it come from?
(4.) I'll look around the car to see.

b. (1.) Visual image;
(2.) That is a young Italian girl in the seat back of me.
(3.) Maybe she has some perfumery on.

c. (1.) Sound sensations;
(2. Thought words) What sweet voices those Italians have!

d. (1.) Visual image of bent handle of a mirror;
(2.) That must be to rest the mirror on.

e. (1.) Visual image of a young lady;
(2.) Secondary visual image of Ruth S.;
(3. Thought words) Ruth S.; But Ruth S. is in New York. She can't be here;
(4.) I'll look again more closely.

f. (1.) Visual image of the same young lady;
(2.) No style about her hair and hat;
(3.) Ruth is so good looking!
(4.) This is surely not she.

g. (1.) Visual image of part of a pin;
(2.) Secondary visual image of the rest of it.

PRESENTATION STEP.—I. In *a*, between 1 and 2, the relation in my thought is more than just that of contiguity; it is one of cause and effect. Between 2 and 3, there is superadded the relation of source, and also in *b*, 2 and 3; between *a*, 3 and 4, the relation is purpose; between *c*, 1 and 2, substance and attribute; between *d*, 1 and 2, design;

between *e*, 1 and 2, resemblance; between *f*, 2 and 3, contrast, and between *g*, 1 and 2, subordination (part and whole).

II. In mere nearness, contiguity of mental states, there is no real relation. The correlations indicated above, on the other hand, are real mental relations.

III. As to their nature, they have been regarded by some writers as differing from contiguity in kind; by others, as complex evolutions of simple contiguity. Whatever their origin may be, correlations are real experiences, and they are the relations, the associations, of the higher forms of thought.

IV. Because these associations face both ways (we may pass from cause to effect or effect to cause, from part to whole or whole to part) they are correlations.

The principal correlations that the intelligence finds among its objects are those of:

1. Coexistence { time, coinherence
2. Succession { time, space
3. Subordination { genus and species, essence and property, whole and part, quantity, proportion
4. Resemblance { resemblance, identity, difference
5. Causation
6. Design-utility.

(J. M. Baldwin, "Hand-book of Psychology.")

APPLICATION STEP.—I. Watch constantly for correlations in your trains of association.

II. Imagine a mind whose thoughts are governed by contiguity only, a stream of thought in which there are no correlations.

III. Which kind of associations, contiguity or correlations, enables a parrot to talk? A child? An adult?

IV. Which kind is involved in learning to spell? In learning the facts of history, of aesthetics? In the process of muscular training? In playing the piano? In housekeeping? In banking?

Which kind is involved in passing an examination? Which is required for scientific knowledge? Which kind is it more valuable to make, more educative?

V. Compare your memory for facts merely contiguous in time and space, such as the number of days in the month, the position of Batavia on the map of Java, with your memory for facts really correlated, such as your knowledge of the science you know and love best.

VI. Read all the books on psychology to which you have access on the subject of associations, not so much to learn the book as to learn the subject.

LESSON V

DEFINITION OF ASSOCIATIONS

PREPARATION STEP.—Here are some lists I have just noticed:

a. (1.) A group of color sensations;
(2. Thought words,) Blue pencil.

b. (1.) Sound sensations;
(2. Thought words,) Miss P.;

(3.) Secondary visual image of Miss P. in another room;
(4. Thought words,) She must be working.

c. (1.) Sound sensations;
(2. Thought words,) She said "Don't close the door."
(3.) I'll leave it open;
(4.) I'll ask her what mail there was.

d. (1.) Sound sensations of my own voice;
(2. Thought words) Was there any mail?

e. (1.) Sound sensations (of Miss P's voice);
(2. Thought words) Not for you.

(A little time ago I had this one:)

f. (1.) Visual image of a calendar.
(2. Thought words) The eighth. I must send something for M's birthday;
(3.) What shall I send?
(4.) Secondary visual image of a box of souvenirs;
(5.) I might send that pillow-cover.

PRESENTATION STEP.—I. How many of these thoughts could I have had without associations? In *a* I could not have known the name of the object. In *b* I could not have "known" the sounds, nor could I have thought of the person. In *c* I could not have planned to do as I did. In *d* and *e* I could not have asked the question, nor could I have understood the answer.

II. In general, without associations a person could not think of the name of anything he saw or of any person; he could not converse with people, as he could not think what to say in answer to their questions, nor could he even understand what they said; he could not read; he

would not know his own name, his own home, and friends; he could not remember what he had done, nor could he make plans for the future.

III. To contrast our imagined condition without associations with our real condition with associations always present: we should have a succession of isolated, disconnected primary sensations coming along like so many beads dropping one by one from a box, instead of the connected flow that we do have, in which the sensations come in a previously established, organized, interrelated network of infinite complexity. Our stream of thought seems to be made up of first, a primary group of sensations of sight, sound, or some other sense, followed by one or more secondary groups in previously established relations, interrupted by another primary group, which in turn is followed by secondary groups, always ordered, connected, continuous all day long, all night long, and all our lives long. All elements of our stream of thought are related, none is isolated. We may then formulate this definition:

IV. The relations between the elements of our mental life that secure for us continuity of thought are associations.

APPLICATION STEP.—I. It is this fact of association that makes us educable. If our organism were not governed by its law, we should be worse off than animals and even than plants, both of which are governed by the same law. And indeed the atoms of inorganic matter must be conceived as ordered in the same manner, for does not a well-worn garment become trained to fit us?

As Professor James says, "Your pupils, whatever else they are, are at any rate little pieces of associating machinery. Their education consists in the organizing within them of determinate tendencies to associate one thing with another,—impressions with consequences, these with reactions,

those with results, and so on indefinitely. The more copious the associative systems, the completer the individual's adaptations to the world.

" The teacher can formulate his function to himself therefore in terms of ' association ' as well as in terms of ' native and acquired reaction.' It is mainly that of *building up useful systems of association* in the pupil's mind. This description sounds wider than the one I began by giving. But, when one thinks that our trains of association, whatever they may be, normally issue in acquired reactions or behavior, one sees that in a general way the same mass of facts is covered by both formulas. * * * ' Those laws *run* the mind.'

" To grasp these factors clearly gives one a solid simple understanding of the psychological machinery. The ' nature,' the ' character,' of an individual means really nothing but the habitual form of his associations. To break up bad associations or wrong ones, to build others in, to guide the associative tendencies into the most fruitful channels, is the educator's principal task." (" Talks to Teachers.")

II. Some one has said, and I think that was Professor James, too, that an uneducated man is nonplused by all but the most usual circumstances.

This statement means, for one thing, that the uneducated man has not been caused to interrelate, correlate, and associate in right relations, or classify what knowledge he has, so that his thought can be nimble, flexible, supple. What he knows is not readily available, here to become a resource, there to point a joke, and again for use in an emergency.

III. " * * * association of ideas is intimately related to strength of character; when close connection is established among an abundance of related thoughts, one is likely to

be quicker, safer and firmer in the decisions he reaches. When we reflect that life consists of a continual debate, that in all matters, whether of morals or business, men are called upon to weigh evidence, to balance *pros* and *cons*, then to act, we see the extent to which the relationship among ideas must influence conduct. No matter how much a man may know, if he cannot think of it when it is needed, if he cannot mass it quickly against a temptation, or if he cannot have the benefit of it all in passing a judgment, he practically knows less and is a weaker man than he might be.

"School education can help to remedy that defect. Since the rapidity and completeness of reproduction of ideas are known to depend upon the closeness of relationship among them, upon the extent to which they are built into chains, or series, or networks, one of the first duties of the instructor is to weave the knowledge that he imparts into one web. Thereby character is greatly strengthened." (Frank McMurry, Ph.D., *Concentration,* "The First year Book of the Herbart Society.")

CHAPTER II

SENSATIONS

LESSON I

DEFINITION OF SENSATIONS

PREPARATION STEP.—The different parts, or members of trains of association are groups of sensations. In this lesson we shall study these elements.

I. As a preparation for the study, name the sensations in the objects about you and in your thoughts somewhat like this:

The sensations that make my table now are browns, grays, greens, and yellows.

I hear the children in the street; the elements that make this experience are sounds of the peculiar quality of children's voices, high in pitch, shrill, loud, and sometimes musical. The sounds of the electric car that I recall hearing yesterday are harsh, loud, metallic, and noisy. The temperature sensation of some beads near my hand is cool; my pen, warm. The touch of the beads is smooth in places, rough in other places.

I recall the organic sensations connected with a church that I entered; they are close, stuffy, and stale.

Notice every hour and write lists of many sensations, both primary and recalled, in your stream of thought.

II. We may think of the nervous system as a single organ made up in general of two parts, (1) the lines of nerve-fibres radiating in pairs to all organs of the body and to every part of its surface from (2) the spinal and cerebral centres.

The function of the lines of nerve-fibres is to carry excitation, or " nerve impulse " to and from the end organs on the one hand and on the other, the spinal and cerebral centres. In the cerebral centres are effected the redistribution of impulses.

What the nature of nerve change in conduction is is not fully known. It seems probable that it is mechanical (vibratory), chemical, and electrical, all three.

III. If the air were colored red so that you could see it, would it not seem to be more really matter? It is sometimes difficult to realize that this invisible substance all around us has weight, that it is impenetrable, inert, and, in short, is as really matter as is the table, the house, or the water of the river. Yet such a realization will help you very much in studying what precedes sensations.

IV. To think the conditions of the Atomic Theory into matter about you will also be a help to you.

Try to realize that the ink and paper of the book, your hand, your clothing, and everything in the room as well are each and all actually made of minute particles, no two of which are in intimate contact, and all of which are in a state of vibration. If you quicken the rate of vibration of the molecules, you will raise the temperature and increase the volume. If this rate is increased still further, the particles will be driven farther and farther apart till, unless chemical change takes place, a solid becomes a liquid and the liquid, a gas. If chemical change does take place, the elements resulting from decomposition become liquid or gaseous. If the rate of vibration of the molecules in a given gas be decreased, its temperature will fall and its volume grow less until its form becomes liquid and finally solid.

Study concretely all matter about you in the terms of this theory. In how many states may each kind exist?

V. The Atomic Theory says that no two molecules of matter, as the paper, are in close contact. In the spaces between the molecules, called pores, is supposed to be an imponderable substance, ether, which, though it has none of the properties of matter, we think as existing. Ether seems to occupy all the spaces that are not filled by matter, those between us and the heavenly bodies as well as intermolecular spaces.

PRESENTATION STEP.—I. I just heard a bell ring, that is, I had a group of sound sensations. Think what had to take place before I could hear these sounds:

The first thing was the striking together of two pieces of metal, the clapper and the bell, in such a way that vibrations of a rapid rate were started in both the bell and the clapper. Next, these vibrations, or waves were transmitted in straight lines by means of the air and other matter in all directions from the bell. Imagine these spheres of motion moving out from the bell as a centre through the air, the walls, the earth, and everything in their way. In the course of time some of this motion reaches my ear-drums, is transmitted through the parts of my ears to my auditory nerves, and thus to certain cells in the temporal lobes of my brain. So far there have been only vibrations of matter. Now, apparently, a wholly new result takes place, in that I have a sensation of sound in my mind.

No one has yet explained how vibrations of matter are turned into a mental state, a sensation. We have to accept the experience as a fact without any explanation. The result then of this particular kind of brain excitation is a sensation of sound in my mind.

II. Let us study next a sensation of smoothness, the touch of my pen:

As my finger tip moves over the pen, changes take place in the terminals of the nerves of touch in my skin. This excitation is transmitted along the length of the nerves of touch through my arm, body, and spinal cord to certain brain cells, and the result in my mind is sensations of smoothness.

III. What takes place in order that we may have a sensation of color is rather more complex. It is perhaps somewhat as follows:

I see the color green of my blotter. The vibrations we are concerned with here originate in the solid particles of carbon in a lamp flame. As compared with those that vibrate when the result is sound, these particles are vibrating at an intense rapidity. The waves thus started are transmitted in straight lines in all directions from the vibrating particles in the flame by the medium ether. Some of the vibrations are reflected from the blotter, though at a changed rate, through my eye,—its lenses and humors to the retina. Excitation is set up in the optic nerve and brain cells, and the result in my mind is the sensation green.

It is probable, also, that when the source of vibration is the sun or any other body in intense enough vibration, the process and medium are the same.

IV. We have studied what takes place when we have sensations of sound, touch, and color only. What occurs in case of the other kinds of sensation is probably analogous. When the sensations are secondary, (recalled, inner) though the end organs and nerves seem not to be excited, the brain-cells are active.

In each case noticed the analysis of what precedes a sensation ends with the words, "the result in mind (of the cerebral excitation) is a sensation of sound, color, or touch."

A generalized form of this statement may be accepted as the definition of a sensation:

The result in mind of cerebral excitation is a sensation.

APPLICATION STEP.—I. Imagine your condition without color sensations. In what terms must a blind man do his thinking? How would you think the thoughts of the last hour without sound sensations? Suppose that you had no sensations at all!

II. Observation of the sensations that you use in thinking will soon show you that there are many more kinds than just those of the five senses of the older psychology. The "five gates of Mansoul" are no longer adequate to furnish our complex mental life. Besides the sensations of these senses, we have those from the organs of the body, that is, organic sensations (such as tooth-ache, closeness, fatigue, hunger), sensations of temperature, pressure, and those from the tendons and joints.

III. The body is like a quivering, sensitized sounding-board, each sense of which responds to its own rate of stimulus. Though not all stimuli result in active consciousness as discriminated sensations, or mental states, each modifies the others and is in turn modified by them, so that the stream of thought at any moment is the resultant of all the bodily stimuli.

IV. The fact that different sensations are the mental results of different rates of vibration in matter seems to indicate that the different senses had a common origin. And indeed such is apparently the case.

The spinal cord and the entire nervous system are believed to have developed from the external embryological layer, the skin, and all the higher senses have arisen as gradually differentiated and specialized forms of touch, the "mother tongue" of the senses.

V. Why do we not hear sounds from the sun, Jupiter, or the " morning stars?"

VI. Suppose your auditory nerve had always vibrated at the same rate: Would there have been a sensation resulting from this particular excitation?

We must think that there would not. Change seems to be necessary to attract our attention. In fact, all sensation might be defined as " consciousness of change." " The chain of consciousness is a sequence of differents " (S. Hodgson, " The Philosophy of Reflection ").

VII. Here again, as in the study of associations, the caution is necessary that, though for convenience in analysis we have spoken of sensations as if they were separate realities, perhaps somewhat like the atoms of matter, they must not be thought of as such.

" No one of them " (mental elements) " can live out of that particular thought, any more than my head can live off of my particular shoulders. In a sense a soap-bubble has parts; it is a sum of juxtaposed spherical triangles. But these triangles are not separate realities; neither are the 'parts' of the thought separate realities. Touch the bubble and the triangles are no more. Dismiss the thought and out go its parts. You can no more make a new thought out of 'ideas' that have once served than you can make a new bubble out of old triangles. Each bubble, each thought, is a fresh organic unity, *sui generis.*" ("Psychology," Vol. I, W. James.)

VIII. Study your stream of thought as though it were made entirely of sensational elements, that is, as though all thinking and experience were in the terms of colors, sounds, touches, tastes, smells, temperatures, and organic sensations. "All thought is the action and interaction of sensations."

Someone has likened sensations to the letters of the alphabet, which have spelled out all of literature; so our sensations spell out for us all our experience, both inner and outer, or primary and secondary.

Learn by daily study this alphabet of mental life;—name and make lists of the elements of many trains of association. Make lists also under each sense of as many sensations as you notice, and analyze what precedes each.

LESSON II

THE SENSE OF SOUND

PREPARATION STEP.—I. Name the sounds you have noticed during the last hour.

II. The analysis of what precedes the sound sensations of a piano I hear is as follows: Hammers controlled by means of a mechanism through the keys of the piano are caused to strike the wires stretched over a sounding-board in the piano case. The wires vibrate as a result, and the air transmits the motion from them in all directions. Some of the waves strike the sounding-board which so collects and reflects them that they are intensified. As reflected these waves travel in all directions through matter, that is, the air, the floor, and the walls of the room and the house, and some of them finally reach my ear. Excitation is set up in the auditory nerve and brain-cells, and there is a result in mind of sensations of sounds.

Go over again and again some similar analysis for yourself, imagining vividly what takes place and tracing with your finger the lines of vibration that come to your ears.

III. Analyze what precedes many different sounds, as voices, the wind, the rain.

IV. How many people do you know by their voices? Name all the differences you notice between voices, talking and singing; between different bird notes, musical instruments, bells, whistles, horns, doors, foot-steps, cars, vehicles, machines.

V. Notice how accurately you can tell by sounds the direction of objects, their distance, size, and material.

VI. What is the range of your speaking voice? Of your singing voice? How many octaves has your piano?

VII. How much do you care for music? What are your favorite songs? Musical instruments? Recall what you know about harmony.

VIII. Start separate lists of all the songs you know that stir and inspire feelings of patriotism, courage; of love of home, nature, God. Classify other songs as those of war, love, the cradle; folk-songs, children's songs, work songs.

What instrumental music has power to move you emotionally?—name the compositions and instruments.

Objects in which vibrations that result in sound originate.

PRESENTATION STEP.—I. In the analysis of what precedes sounds you must have noticed that a) sometimes the waves are started in each of two solids struck together, (as in the clapper and the bell); b) sometimes in liquids falling into liquids, (as in a water-fall); and c) again, in a gas impinging a gas, (as in thunder). Observe also that the vibrations may originate d) from contact of any two different states of matter, as when a solid and a liquid are set in motion by contact (rain falling on the roof).

The objects in which vibrations originate that result in sound are of matter in solid, liquid, or gaseous form.

Media for waves that result in sound.

II. As there must be some form of matter to vibrate in order to start the motion that results in sound, so there must be some form of matter to carry the vibrations. Since, for example, the piano was in another house, the waves to

reach my ear had to travel through both the air and the solid walls.

Strike the brush and soap together under water. Can you hear them? The liquid must transmit the vibrations part of the way.

Close the air passages of the ears with cotton for half an hour. Do not vibrations from the house and street still come to your auditory system through the ground, the building, and the bony framework of your body? Do not confuse the jarring motions with sound oscillations.

Accustom yourself to detect the media for the different vibrations that affect your ear.

Matter in some form, solid, liquid, or gaseous is necessary to transmit waves that result in sound.

III. The organ of the sense of hearing is composed of three easily distinguishable parts, the outer, the middle, and the inner ear.

The organ of the sense of hearing.

Of these, the outer ear, a fold of skin and cartilage, reflects the air-waves and air-shocks into the hollow tube which is closed by the tympanic membrane.

This membrane is thrown into vibration by the motion of the air particles, and its motion is transmitted to a series of three bones within the middle ear, a hollow in the temporal bone.

Next adjoining the middle ear is the inner ear, a series of hollows also in the temporal bone, a very minute structure and wonderfully complicated.

In some way excitation transmitted to the inner ear is communicated to the auditory nerve and finally to terminals in the temporal lobes of the brain.

The ear has been fancifully likened to a tiny piano with a keyboard for the air to play on.

IV. All the knowledge that we get through the sense of hearing is included under the term sounds.

owledge rough e sense of und.

Probably all of the sounds that you have noticed are complex, that is, they are made up both of noisy and musical elements, and, depending upon the preponderance of one or the other, are called noises or music.

1. Sounds the result in mind of a slow and irregular rate of vibration are noises, (as, the pop of a soap-bubble, the sound of a footstep);

2. Those, the result of rapid and regular ones are musical. Among the differences that should be noticed in musical sounds are those in a) pitch, b) intensity, c) volume, and d) quality.

a). In pitch a sound is acute or grave. This characteristic is found to depend on the number of vibrations in a given time necessary to produce the sound,—the greater the number, the higher the pitch. The gravest musical sound audible is the result of about sixteen regular vibrations the second. Jars or shocks slower than this rate are not heard at all. The highest estimate of the limit of acuteness places it at fifty thousand vibrations the second.

From the fact that there is a certain definite proportion in the rate of vibration for musical tones, the science of harmony is possible.

Though the ear is susceptible to 11000 differences in pitch, only about ninety are used in the musical scale, which falls well within the vibration rates of 64 to 5000 per second. The range of the music that we know is relatively not many octaves higher and lower than that of the human voice, perhaps because it all evolved from singing. Among the great operas *Lohengrin* is interesting as the only one written chiefly in the higher register.

b). By the intensity of a sound is meant its loudness or softness. The amplitude of the waves in the vibrating source determines this characteristic. The distance of the vibrating

source also makes a difference in the loudness or softness of it.

c). The sounds you have noticed differ also in volume, that is, in their amount, fullness, or quantity. One voice, for example, is of less volume than a hundred voices—an organ tone has greater volume than that of a piano.

d). But perhaps the most interesting difference in musical sounds to the amateur observer is that in quality. The pitch and intensity of two voices may be the same, but it is the peculiar quality of each that identifies it for us.

The explanation of this characteristic of sound is in the fact that every vibrating body moves as a whole and at the same time also in parts. The vibration of a body as a whole results in its fundamental tone; that of its parts, in overtones. The effect of the blending of these tones, different for every substance, is the quality, or *timbre* of sounds.

APPLICATION STEP.—I. How many differences in sounds did you name in the Preparation-Step? Classify those differences now in something like this list: Differences in sounds in

1. Pitch: High, low, shrill, grave, soprano, alto, contralto, baritone, bass, flat, sharp, piercing, acute, deep.

2. Intensity: Penetrating, loud, soft, heavy, faint, strong, powerful, timid, bold, strident, piano, forte.

3. Volume: Heavy, light, tiny, pipy, small, little, puny, fine, full, rich, masculine, feminine, chest and head tones, pompous, ineffective, bellowing, booming.

4. Quality: Musical, unmusical, noisy, sweet, harsh, hoarse, fine, coarse, cornet-like, throaty, aspirate, guttural, strident, flute-like, masculine, feminine, reed-like, silvery, alto, soprano, tenor, bass, rumbling, slamming, clashing, crashing, tearing, ripping, sonorous, crackling, rolling, pen-

etrating, childish, bird-like, husky, rasping, nasal, chest and head tones, gay, solemn, tinny, metallic, pleasant, whining, having a tang, sharp, resonant, uncultivated, breathy, sympathetic, mellow, flat, lifeless, squeaky, dry, strained, dull.

II. Of musical instruments that we know the flute has fewest overtones, and for that reason it is often regarded when played alone as rather colorless. The violin on the other hand has many overtones and noise elements, and thus infinite possibilities in character.

III. Analyze noises to determine tone elements (pitch) in them. Some one says that the roar of a great city is in F.

IV. Think of ways in which we extend the sense of hearing: Explain the megaphone; the ordinary speaking-tube; the dentiphone; the graphophone; the electric telephone.

V. Do you see now why we do not hear sounds from the heavenly bodies? There is no air most of the way out, no matter to transmit whatever waves there are from them to us.

VI. Americans are much criticized for their lack of cultivation in voice and speech. Richard Harding Davis tells about "the high public-school voice." The French people at home, since they think we cannot speak our own language, choose the English in preference to us to teach their children English. In Henry James' judgment, "The parts of our speech, the syllables of our words, the tones of our voice, the shade of our articulation, are among the most precious of our familiar tools." Here is much food for thought for American teachers.

VII. "No genius is more precocious than that for music, and with talent, progress during the early teens is often prodigious. For the average youth there is probably no such agent of educating the heart to love of God, home, nature, and hence there is no aspect of our educational life

more sad than the neglect or perversion of musical training from this, its supreme end. * * * Darwin holds that music, instead of originating in speech cadences, as Spencer thinks, sprung from and is reminiscent of the physchoses of old courtships of a long past age.* * * Singing is the most universal language, because it is the language of feeling. Piety, patriotism, all the racial and domestic sentiments and love of nature can be thus trained. Teachers of singing have drifted very far from the intent of nature in this respect. Love, home, war, religion, country * * * it is their first duty to preform in the heart. The merely technical process of reading notes is a small matter compared with the education of the sentiments." (G. S. Hall "Adolescence.")

LESSON III

THE SENSE OF SIGHT

PREPARATION STEP.—I. How many colors do you know by name? Write out the list.

II. If you had always been blind, how much of the world about you should you miss? Study it out at your leisure in detail.

III. In order that I may see the red of a Christmas bell at which I am now looking vibrations started in the sun must come through the medium ether, undergo a change at a certain part of their course, reach my eye, and set up nerve impulse in my optic nerve and brain cells. Then there is a result in my mind of the color red.

IV. How do different reds differ? How is dark red made in mixing paints? Light red? pink? purple? brown? If possible, combine color disks on a wheel to analyze the complex color effects of the clothing you have on and of objects in the room.

V. Do you ever see colors with your eyes closed? Recall a blue-print you saw recently; a grove of trees. Did you not think these in blues, browns, and greens? Study the images carefully, as it takes a little time to realize that most of us think often in the terms of secondary visual images, and that even with the eyes open. Of what use are your eyes in absolute darkness?

VI. If a flame of hydrogen is burned in an atmosphere of oxygen can you see it? Why must calcium be introduced?

VII. Notice the photographs mounted for a stereoscope: they are not alike, but the lenses of the instrument so combine them that they make one picture, and that one in perspective.

How accurate is your estimate of distance by sight?

Study the photograph or the painting before you as a group of colors representing distance.

VIII. Speaking and writing are familiar means of expression; why might not drawing be as commonly used? What advantage would it be to you to sketch as readily and as effectively as you talk? What would the last letter you wrote gain by illustrations?

Objects in which vibrations that result in color originate.

PRESENTATION STEP.—I. a. The vibrations to which the eye is sensitive may originate in solid matter (as in a glowing coal; solid particles of carbon in a flame of gas, oil, or alcohol; red hot iron; the carbon of an electric light,) and in certain liquids (molten glass, iron,); in certain substances not in combustion said to be phosphorescent; in a vacuum under certain electrical stimulus, and in some other conditions not understood.

b. The source of most of the vibrations that make possible color for us is the sun. This body is matter in a state

of intense vibration and it gives off its vibrations in all directions at all times.

We see all sides of the sun in the course of a year, though we are on the side of the earth that is turned away from the sun half of the day. Since there was not light enough to see to follow the occupations of the daytime during this half, we as a race have formed the habit of sleeping through most of it.

c. Though only a few objects originate vibrations that result in color, an innumerable number constantly reflect these waves from every point of their surface. It is, in fact, by means of reflected lines of vibration that we see everything except the so-called self-luminous objects, that is, those that are themselves originating the motion.

A surface that reflects all the vibrating rays unchanged is a perfect mirror and is itself invisible.

II. a. The medium for vibrations resulting in sounds is matter in solid, liquid, or gaseous form. No one of these forms of matter is necessary, however, to carry the waves that result in color, though all three will allow them to pass through under certain conditions. **Medium**

Matter that will allow all the vibrating rays to pass through is said to be transparent, and if it does not reflect any vibrations cannot itself be seen.

b. Little is known of the medium that transmits the waves to the eye. From their phenomena it seems probable that they, the waves, conform to the same laws that govern like conditions in the sense of sound, therefore we speak as though there were a medium analogous to matter and we call it ether.

III a. The eye is a combination of lenses which bend the vibrating rays of ether so that they may be brought to a focus on the retina, the true nervous end organ of sight. **Organ.**

These lenses are a development of layers of the skin. The retina, which lines the back part of the eye-ball, is a bit of the brain pushed out to meet the particular physical excitation to which it is sensitive.

The eye-ball is moved in its socket by six strong muscles.

b. The effect of having two eyes is that we see our world in perspective. A simple experiment will show you something of the mechanism of this phenomenon:

Hold your left hand six inches in front of your face with the palm facing toward the right, the thumb toward your face. With the left eye closed draw what the right eye sees of the hand. Next, without moving the head or hand, draw what the left eye sees. These pictures are not alike. Through the right eye you saw the thumb and palm, through the left, the thumb and back of the hand.

Observe many objects in the room through each eye separately, and you will find that the pictures on the two retinae are never just alike.

Now these two images are always combined by the eyes in such a way that there is in the mind one image, and that is in perspective. We wear a stereoscope all the time, only it is a natural one, and as a result we say that we see a third dimension in our world.

Knowledge.

IV. a. The result of the stimulus of the optic nerve is in general brightness and color of varying intensity. All our visual experience may be reduced to the following simple elements:

1. Colorless light elements, white, gray, and black—(in evolution, the primitive experience, dating back to the eye-specks of jelly-fish).
2. Red, yellow, green, blue—(later, more complicated in race experience, the results of vibrations from 440 billions to 790 trillions per second).

b. From your observation of colors you will no doubt have been astonished at the multiplicity of them required to make your world. Most of this great number seem not to differ fundamentally from each other, but to have resulted from the combination of the few simple elements named above.

c. A color is pure, or saturated in proportion as it is free from all admixture with other colors. The colors that we see in nature and that we use in clothing, decoration, and art are rarely pure. Without combination with both black and white a pure color would seem crude and bizarre, and usually other colors, as well, enter into the complex.

d. There is no science of colors corresponding to that of musical sounds, harmony.

APPLICATION STEP.—I. Though we cannot hear sounds from the heavenly bodies, we can see their light. The vibrating rays that they originate or reflect are readily transmitted " through ether " to us, and we see the glories of an innumerable host.

II. We extend the sense of sight by the artificial lenses that we wear over our eyes, as eye-glasses and spectacles. Explain opera glasses; a telescope; a microscope.

III. What is the influence of sight on other senses? Compare your enjoyment of music when you cannot see the musicians with that when you can; of speaking when you cannot see the speaker with that when you can.

It is noticeable that those who become blind lose their appetite. Think how much sight adds to our enjoyment of the table.

IV. Correspondences between color and sound:

a. Both are the result in mind of vibration, sound of rates from 16 up to 50,000 the second; color, of rates up in the billions and trillions.

b. Sensations of simple noise in sound correspond to sensations of brightness in sight.

c. The rapidity of the periodic rate makes the difference in the pitch of sounds; in sight, it makes the difference in colors, the red end of the spectrum corresponding to the grave tones, the violet to the shrill tones.

V. According to the theory of evolution, the race is evolving toward insensibility to the red end of the spectrum and, on the other hand, to greater sensibility to the violet end.

In support of the theory it is noticed that savage races have been found having names only for black, white, and red. They have not yet evolved to a knowledge of blue.

Color blindness, moreover, is blindness to red. Savages are rarely color-blind (only one in twenty); civilized races are losing their sensitiveness to the red end of the spectrum (one in five of those tested for positions on railways fail through ignorance or absolute color-blindness). On the other hand artists and those trained in color see violet in all nature and as a part of all color experience.

An experiment made with a group of men and women showed that of 30 men, 10 to 3 preferred blue to red; of 30 women, 4 to 5 preferred blue to red. Since woman is more generic than man, this result was regarded as further confirmation of the theory that we are losing sensitiveness to the red end and gaining sensitiveness to the violet end of the spectrum.

VI. At first thought it would seem that besides colors we see distance, form, shape, size, and position. Yet the optic nerve does not respond in different ways (that is, rates) for colors one yard away and for the same colors five yards distant; for a square object and a spherical one; for a large object and a small one.

We know the distance, size, and shape of the table as compared with those of the wall by the associations we have established with different groups of colors before. When the given groups of colors are in mind, we think at once, The wall is farther away than the table; the table is not so broad as the wall and is square.

VII. Remember that to be blind is not always the same as to be in darkness. Though a child sees colors he is blind to many objects, forms, and distances, because the given colors are not discriminated and correlated with other parts of his experience.

A blind man on first having his " sight restored " is as blind as he was before. To be sure his optic nerve is assailed by as many stimuli as ours is, but he has a long and complex process of establishing associations to go through before he can have in his mind a definite group of colors followed by the thought, " my cat " or " the floor."

Did you ever think how convenient it is to be able to see objects at a distance? Suppose we had to depend on touch and sound alone in judging distance.

We have always to remember that it is not the eye but the mind that sees.

VIII. How many colors did you find that you knew by name?

It seems that naming makes a difference in knowledge of color. It was found by experiment that when three different shades of gray were exposed, the subject on seeing each one alone later readily identified it. But when two additional shades were inserted among these three, making five graduated grays, the subject was not sure of any one when it was shown alone. When, however, the shades were marked 1, 2, 3, 4, and 5, the subject later readily identified each one.

The conclusion drawn is that if we knew more color names, that is, if there were names and we learned them of more of the colors that we see, we should be able to remember and use a greater number of them and should have greater thought power in everything that involves imaging in color.

It is said that the workers in mosaic in the Vatican must have distinguished as many as 40,000 colors. Frederick Tracy found in his examination of child vocabularies, a few years ago, that out of 5400 words known to children only about 30 are color terms.

We have not only no science of color but also no system of naming colors that is in any measure adequate to our experience. It is to be hoped that some ingenious mind will devise such a system for the benefit of kindergartens and primary and intermediate grades. There is much, meantime, that can be done in training the color sense of children.

IX. If one knew more, that is a larger number, of color sensations rightly correlated, what difference would it make in his ability to think?

Surely he would have more power in those lines involving color and a knowledge of color. But multiplicity of sensations alone, notice, does not make all the difference; their relations as well must be considered. Imagine a mind with the color discrimination of an artist, the knowledge of sounds of a musician, and the sensitiveness to touch of the blind, and all these systems adequately correlated in the higher forms of thought. What about its power? Would the person having such a mind be a better statesman, mechanic, son, than he would be were he blind and deaf? In what ways?

The two senses of sight and hearing certainly supply material greatly superior to that of the others for elaboration into ideational processes.

Yet education must guard against arrest of development in that stage of advancement when sensation is the predominant mode of thought. Among races this condition is illustrated by the Indians. The excessive training of their senses seems to have had the effect of stultifying their later and higher power of thought.

X. The study of genetic psychology shows that the best time for sense-training and development of the powers of observation (that is, supplying a large potential of sensations in right relations) is probably before nine years of age. The spontaneous curiosity and love of nature that characterize childhood, the " native tendencies " of the period offer a wonderful opportunity for such training.

XI. Then again at adolescence occurs a distinctly different phase of sense development and training. The medullation of new associational fibres in the brain and the almost spontaneous outburst of the great wealth of the emotional nature modify the problem of teaching here fundamentally.

" There is, no doubt, an important change in the relative prominence of the different senses in our psychic life at this stage (adolescence) with its new emotions, interests, and apathies. Adolescent years mark the golden age of sense, which is so prone to become sensual if uncontrolled. Then the soul exposes most surface, as it were, to the external world. The eye gate and ear gate especially are open their widest, and not only that, but the feeling tone and the general sense feeling, so largely independent of perception, are also at their best, so that the possibilities of knowing our world and acquiring experience on the one hand, and of lapsing to a life of indulgence, are now most developed." (G. S. Hall, "Adolescence.")

LESSON IV

TASTE AND SMELL

PREPARATION STEP.—I. To get material for the generalizations of this lesson, let us take the smell and taste sensations that go to make up a single meal—for example, breakfast:

Suppose we start with grape fruit: It has a faint fragrance, a sweet taste, a slightly bitter taste, and a somewhat sour taste, also a peculiar flavor. Suppose cereal with cream comes next: The cereal has a salty taste, is sweet, and has the peculiar flavor of oatmeal; the cream is sweet and has a flavor peculiar to it. Both have slight but characteristic odors. The next course is, say, bacon and baked potatoes with coffee and rolls. The bacon has a pungent odor and a smoky flavor; both it and the potatoes have a salty taste, and the potatoes have a flavor peculiar to them as well as an odor. The coffee has a characteristic odor, a flavor, and a sweet taste.

II. a. In order to have the sweet taste of the sugar in the coffee particles of the solution must come in contact with the nerve terminals in the tongue. Excitation peculiar to the gustatory nerve is set up, brain-cells are changed, and the result in mind is the taste sensation sweet.

b. The smell of coffee: When the coffee was boiled a true gas was given off into the air. Matter is minutely divisible and widely diffusible, so that tiny particles often travel through small openings and long distances. Thus minute particles of the coffee traveled through several rooms, keyholes, and small cracks, and were breathed into the nostrils with the air. They came in contact with the terminals of the olfactory nerves, which are distributed in

the mucous membrane lining the nasal passages, set up an excitation in the nerves and brain-cells, and the result in mind is a sensation of the odor of coffee.

III. After you have observed carefully many substances that have taste, make experiments with them. Try tasting meats, vegetables, and fruits (all minced, so that their peculiar resistance and touch sensations shall not identify them) with the nasal passage stopped. You will find that celery, steak, and many other foods have no "taste" left.

IV. Observe carefully all the sensations in connection with what you eat at every meal.

V. What difference does a cold make in your enjoyment of the table?

VI. Experiment to find the differences in sensitiveness of different parts of the tongue to sugar; to salt, vinegar, and quinine.

VII. Make lists of the other substances besides foods that have tastes and smells.

PRESENTATION STEP.—I. a. The tongue, especially its sides and the tip and back of its upper surface, the forward surface of the palate, and sometimes other parts of the mucous membrane lining the mouth cavity are sensitive to taste stimuli. **The sense of taste organ.**

b. Not all parts of the tongue furnish us given sensations with equal sensitiveness. The tip seems to be particularly sensitive to sweet and salt, the sides to sour. Some substances, furthermore, such as saccharine, produce one taste in one part of the mouth and a different one in another.

c. In masticating food relish for it increases from the tip to the back of the tongue, an inducement that has evolved with us to keep the morsel moving backwards till it is swallowed.

d. The sense of taste seems often to improve through life and sometimes to develop to an exquisite degree of sensibility in old age.

Objects. II. To stimulate the nerve terminals in the tongue matter must be soluble in water or saliva and must be in contact with the tongue. If the tongue is dry, no taste sensation is possible.

Knowledge. III. a. There seem to be only four taste elements, salt, sour, sweet, and its opposite bitter.

b. Another class of sensations peculiar to the tongue, though more complex than these four since they involve touch, are those like alkaline, astringent, fiery, acrid, metallic.

c. All these sensations, however, are not enough to cover our experience with food. What we loosely speak of as different tastes are often complexes of odors, motor experiences, pressures, pains, visual elements, and sensations of temperature with a far more limited number of taste elements than we ordinarily suppose.

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The sense of smell. Organ. IV. a. Because of the difficulty in localizing within the nostrils the areas of the olfactory nerve terminals, little is really known of the physiological conditions of smell.

Exhaustion of the nostrils for certain continuous smells seems to show that different parts of the end organs, as in taste, are affected by distinct stimuli.

b. Each nasal cavity opens at its farther end into the pharynx, and it is through this passage that gaseous particles from the mouth enter the nostrils to stimulate the smell sensations, flavors, that so often seem to be a part of the taste of our food.

c. The human brain is far less developed in its olfactory centres than the animal brain. The power of discrimina-

tion in this sense and consequent instruction and guidance by means of it are relatively great among many animals, especially carnivorous quadrupeds, like the dog.

V. The fact has recently been established that the smell stimulus is always a true gas. The presence of oxygen seems necessary to stimulation, since, in human beings, at least, in case the nostrils are filled with liquid no smell sensation results. **Objects.**

The sense of smell has been called "taste at a distance." Yet in smell, not less than in taste, contact with the matter is necessary to stimulus.

VI. a. Smell sensations may be classified as sweet, or fragrant, (as rose, jasmine, apple,) and their opposites. **Knowledge.**

b. Those odors in sympathy with the lungs have been described as fresh and close. Fresh odors have a refreshing, quickening, exhilarating effect on the lungs (as *eau de Cologne,* lavender, peppermint, musk). Close or suffocating odors arise from a depressed action of the lungs. (Deficiency of oxygen, the decay of organic matter, the effluvia of crowds lower the powers of life and are accompanied by a depressing effect.)

c. Many odors (like ammonia, nicotine, mustard) have a quality derived through the excitation of the nerves of touch, a sharp, stinging sensation described as pungency.

d. The sense of smell is less acute in children than in adults. The abundance of mucous in infancy and the presence of mechanical difficulties in the form of the nostrils up to seven years of age explain this obtuseness of smell sensibilities in childhood.

APPLICATION STEP.—I. Has the wood of your pencil taste? Can you not tell pine from cedar by tasting them? And is wood soluble in saliva?

Of course it is not, but it may contain oils or gums, minute particles of which passing through the nasal passages when you put the pencil in your mouth affect the sense of smell and give a characteristic flavor to the wood.

In order to have the sensations of the flavor of the wood of my pencil, (taste yours and follow the analysis through with me,) small particles of an oil in the wood are set free in my mouth as the pencil touches my tongue and in the act of expiration accompanying tasting are carried into the cavities of the nose and start an excitation in the nerves of smell. The result in mind is the sensation of the flavor of wood.

Resins are not soluble, for example, spruce gum. This resin contains an essential oil, however, that gives it its peculiar, agreeable flavor.

II. When you place a drop of camphor on your tongue it smarts and there is precipitated a white insoluble substance. This precipitate is camphor gum, an essential oil, not soluble in water, hence without taste. It has, however, the strong odor and the characteristic flavor by which camphor is readily identified.

III. Determine by experiment whether the following substances have tastes or flavors, or both: Oranges, peaches, apples of different kinds, currants, olives, peanuts, butternuts, dates, onions, turnips, potatoes, celery, lettuce, vanilla, tea, vinegar, cinnamon, cloves, lemon, radishes, pepper, chocolate, alum, brass, rubber, paper, leather, celluloid, glue, ink, fish, turkey, and many others.

IV. "The famous mosque of Saint Sophia in Constantinople is always fragrant with the odor of musk and has been so ever since it was built in the ninth century, the curious thing being that nothing is done to keep it perfumed. The solution of the seeming mystery lies in the

fact that when it was built, over 1,000 years ago, the stones and bricks were fixed with mortar mixed with musk."

This example illustrates the extraordinary degree to which some matter has the properties of divisibility and diffusibility.

V. Kipling tells about "the hair-trigger-like sensitiveness of a Jungle nose."

Imagine what a dog is thinking in a room full of people. Where to us it seems a multiplicity of colors and sounds, it probably seems to the dog a bewildering complex of smells.

VI. "Art employs visual and auditory materials, both because they admit such numberless combinations, and because, also, forms and colors are relatively permanent and sounds are readily reproducible. Odors, on the other hand, are far less capable of fusions and are neither permanent nor easily revivable, hence they are of little importance in art; and so it comes about that the perfumer is even less likely than the cook to be reckoned among artists." ("Psychology"—Mary W. Calkins.)

VII. " Taste is the door-keeper at the entrance to the alimentary canal, and the human face, including nose and eyes, which are primarily food-finders, and the jaws, which are triturators, have developed as accessories. All the higher metabolism depends upon keeping the appetite true to the needs of the body, like a somatic conscience always pointing steadfastly toward undiscovered poles, the one of nutritive need and the other of human destiny." (G. S. Hall, "Adolescence.")

LESSON V

TOUCH, MUSCULAR, TEMPERATURE, AND ORGANIC SENSATIONS

PREPARATION STEP.—I. Stand up for a moment: How long could you stand if the soles of your feet were com-

pletely insensible? Could you rise, step, walk, run, skate? Imagine each of these movements if the hip joints were insensible to the weight of the body.

II. Notice the resulting sensations when you touch fur, the bristles of a stiff brush, cold water, warm water; notice the touch and pressure sensations of clothing on different parts of the body; heft the weight of a book; recall how your hat feels on your head; press the rubber of your pencil, your collar with the muscles of your neck; recall sensations of hunger, of the enjoyment of food, of your foot asleep, of tickling, itching, smarting, fatigue, feverishness.

III. Hunger seems to be a matter of the general depletion of the blood. Perhaps because we connect sensations of repletion with the stomach, we have come to localize those of hunger in the same organ. When the nerves of the stomach are deranged in a certain way, the excitation is transmitted to the brain and the result in mind is the sensation of hunger.

IV. The pressure of my collar against my neck affects the nerve terminals in the skin and muscles there, the excitation is carried to the brain, and the result in mind is a sensation of pressure, or resistance.

V. Clench the hand firmly, but in such a manner that its surfaces do not touch each other. Pick out some one muscle of a finger or part of the palm, look at it carefully as it is strained and find out just where the sense of strain is localized. Is it not where the tendons, or fibrous cords connect the muscle with the bone? As you move the finger can you not detect also sensations of the jamming together and stretching apart of the joints and of the contraction and relaxation of the muscles?

All muscular action takes energy, and all conscious muscular movement takes more or less conscious effort. Notice

the effort required to rise from your chair, to walk, to talk, to write.

VI. Analyze into sensations the experiences of yawning, coughing, sneezing, hiccoughing, stretching the muscles, swallowing.

VII. Do you know anybody who is ever moody, irritable without outward cause? What is your habitual outlook on life, optimistic or pessimistic?

PRESENTATION STEP.—I. The organ of the sense of touch is the surface of the entire body. Not all parts of the body, however, are equally sensitive. The upper surface of the tongue is exceedingly delicate, as is also the mucous membrane which lines the nostrils. Parts of the eye, and the lip seem to rank next in sensitiveness to touch, and the other parts of the body, speaking very generally, in the following order: the palm of the hand, the sole of the foot, the forearm, leg, shoulder, breast, abdomen, back and upper part of the thigh. **The sense of touch. Organ.**

II. a. In order to affect the sense of touch, matter must be in solid form. We do not say of water and air that they feel smooth or rough to the touch. We know their presence by the senses of temperature and pressure rather than by touch. **Objects.**

b. No medium is to be considered in connection with touch; actual contact with solids is necessary to stimulate the nerve terminals that one may have primary sensations of touch.

III. a. The simplest knowledge through the sense of touch is that of contact. Next most simple is that of smooth and rough. Still more complex are classed coarse, polished, damp, sticky, oily. For all except the simplest knowledge, motion and pressure as well as contact are necessary. **Knowledge.**

b. It is commonly thought that we know hardness by the sense of touch. Critically speaking, however, this is not the case.

It is true that we know certain types of hardness by the sense of resistance, but the physical quality of hardness is more complex than the simple sensation of resistance. This quality is defined as that which matter has of resistance to being scratched or having its particles torn apart. The diamond scratches glass, therefore it is harder than glass.

The way to determine the hardness of a material is to test it by another material. If it is scratched by that other, it is softer than it; if it scratches the other, it is harder. The sense of touch alone, by the simple process of contact would never determine this quality of hardness or softness.

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he muscular ense. Organs. IV. The muscular sense involves the muscles, skin, joints, ligaments, and tendons.

bjects. V. Matter in any form, solid, liquid, or gaseous may start the excitation of the nerves that results in sensations of effort and pressure. It may be started also, by any motion of the body.

nowledge. VI. a. The two distinct elements involved in movements of the muscles are first, sensations of effort and second, sensations of resistance. Through these sensations we have a knowledge of force and extension.

b. The muscular sense is developed very early. It makes our ideas of the activity of the muscles of the body as concerned in movement and balancing. Perhaps a child's first ideas of the self as active come as soon as the limbs are moved. This experience would be the beginning of attention, as well as the first knowledge of the external world, and ultimately the ideas both of mental and of physical force.

c. Taken alone, however, the muscular sensations give us little knowledge. Without touch and sight, movements of the body are co-ordinated in only a vague way.

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The sense of temperature. Organ.

VII. The temperature sense has its end apparatus in the skin. "Temperature spots," minute points, the terminals of nerves, some for heat and others for cold, are scattered over the skin in varying degrees of nearness to each other, with consequent variations in the delicacy of perception.

Knowledge.

VIII. The stimulus of the temperature spots results in mind in sensations of warm and cool, hot and cold.

* * * * * * *

Organic sensations.

IX. As the name organic implies, these sensations are localized in the different internal organs of the body, as the muscles, the nerves, the circulatory and nutritory tracts, the glands, the heart, the lungs.

Mode of action.

X. The sources of excitation of the nerves connected with these organs are often in injuries or disease, often in some form of well-being.

Knowledge.

XI. a. Some classes of organic sensations that we discriminate are:

1. Muscular: cramp, spasm, pains that are acute, intense, racking, burning, shooting, pricking, smarting, aching, stunning, rheumatic; pains of muscular fatigue, and pleasurable sensations of repose, falling to sleep.

2. Nervous: fatigue and exhaustion, neuralgic sensations, weakness, prostration, ennui, heaviness, dullness, exhilaration, elation, irritability.

3. Sensations connected with nutrition: hunger, thirst, repletion, indigestion, nausea, relish.

4. Sensations connected with circulation: those arising from stricture, from long confinement in one posture, the prickly sensations of one's foot asleep. "The sleek, fat,

full-blooded temperament has its peculiar mental tone, attributable to the circulation and nutrition rather than to the quality of the nerves." (A. Bain, "Mental Science.")

5. Sensations connected with respiration are suffocation of varying degrees, grateful freshness, buoyancy, fainting, bracing.

b. All organic sensations undoubtedly reduce to more or less complex groups of those we know at the surface of the body as pressure, temperature, and pains.

c. The organic sensations are not of a high order intellectually. Yet, these vague feelings of bodily comfort or discomfort are of great value in mental life since they form the background of our emotional condition. "They indicate an elevated or depressed condition of bodily vitality and give general cast to our state of mind. The dyspeptic soon becomes unreasonable or gloomy, and biliousness interferes with the normal activity of the mind." (J. M. Baldwin, "Hand-book of Psychology.")

APPLICATION STEP.—I. Which are harder, metals or minerals?

"Metals," did you say? No, we use minerals to scour metals, therefore minerals must be the harder.

II. Study touch, pressure, and temperature sensations in connection with the identification of different kinds of food in the mouth.

III. Analyze many movements of different parts of the body in the terms of joint, tendon, and muscular sensations.

IV. Watch for secondary organic sensations in trains of association: as, the remembrance of the thrill that followed the sight of the flag; the qualm that followed the imagination of a sharp blade drawn through the hand; the peculiar

inner shudder that followed the sight or touch of a writhing snake.

V. We extend the senses of touch and resistance (that is, we experience smooth, rough, and pressure) through the hair, the teeth, the clothing, the sleeve, the sole of the boot, the hat, the pen and paper, the walking-stick, the fishing-rod, the building—(I can feel through resistance sensations the nature of the vehicle in the street when it passes over some pipes laid there that connect with this building).

The sense of temperature is supplemented by the thermometer; the sense of pressure by the scales. All machines, however simple or complicated are devices for changing the direction of force, either of the muscles or for the advantage of the muscles.

VI. As might be expected in connection with so fundamental a sense as touch, a great number of our primitive, instinctive fears are touch fears and complexes of them. Spencer's theory of the development of the eye as anticipatory touch to avoid sudden contact, and the definition of science as prevision organized to enable man to anticipate shock from afar indicate the sensitiveness of the organism during the course of evolution to injurious contacts and its wonderful power of adaptation to its environment.

VII " The true beginning for a psychology essentially genetic is hunger, the first sentient expression of the will to live, which with love, its other fundamental quality, rules the world of life, * * * every organ is in a sense a digestive organ * * * and man is what he eats and what he completely digests * * * all fins, legs, wings, and tails were developed either to get food or to escape finding a grave in some other creature's stomach * * *. Some two-thirds or more of all the kinetie energy of the human body goes to digestion * * *. In the slow pro-

cess of cephalization by which the brain and centers develop near the mouth end of the alimentary canal, the first laugh, if Spencer is right, was in prospect of food." (The first nod, an affirmative biting toward food; the first negation, a turning of the mouth away from food; and the first kiss, a little bite.) "The great epoch marked by the descent of fire and cooking not only economized digestion and freed its energy for higher uses, but evolved hearth, home, and mealtimes * * *. Every cell and tissue has its own specific hunger, and what we call appetite is a symphony of many parts or a net algebraic result aggregated from the specified hunger of all the tissues and cells * * *. Sensation and perhaps thought, are in one sense functions of nutrition. If the parts and molecules latest to develop and most distinctively human, being more complex than others, * * * are broken down in the function of thought and feeling, we can well understand that the nervous system, which is the master tissue of the body, may be the seat of the highest complexity, where matter is most nearly transubstantiated into soul * * *. In a sense every disease is due to cell hunger, and old age and death are progressive starvation. Most of the diseases of middle and later life are probably due to avoidable errors of diet." (G. Stanley Hall, "Adolescence.")

CHAPTER III

PERCEPTION

LESSON I

DEFINITION OF PERCEPTION

PREPARATION STEP.—I. The stream of thought is a unit. We may study it, however, from many different standpoints. Just as we may look at the capitol from the side of its architectural features, its use, or its history, always remembering that it is the same building, so we may consider the same thoughts under such aspects as associations, sensations, memories, or attention. We must not mistake the standpoints, however, for separate "faculties," since no faculties can be separated from the action and interaction of sensations in the stream of thought.

When we studied our thoughts from the point of view of associations, we were thinking of the relations that exist between their elements; when from that of sensations, we were thinking of the elements themselves.

Our study in this lesson will be from the standpoint of perception.

II. Name the parts of the room and the objects in it. Would there be anything left of the room if all that you have named were taken away? If there would be, keep on naming till you have exhausted it all.

Each object has a place in space and a definite relation to other objects. You think of each one now, you remember to have seen it in the past, and can imagine that you will or will not see it in the future, and thus each one has also definite time relations.

Name, next, and think of all the objects and parts of the house; of the city; the state; the earth; all your universe.

Everything you have thought of is matter in space, and it all goes to make up your outer world. It all has the universal properties of matter, such as weight, porosity, divisibility, inertia, impenetrability, indestructibility.

III. In order to have the sensation of a burn on the back of my hand, the nerve terminals there must be excited, the vibrations must be carried along the length of the nerve through my arm and spinal cord to the brain, and there must be a result in mind, a sensation of pain, a burn.

Suppose that the nerves and brain-cells here involved had always been excited in just the same way, would there be thinkable any sensation resulting in mind? Surely not. There must be a change in the physical condition and a consciousness of the change in mind in order that a sensation may be in mind.

IV. Where are all the sensations that you have noticed and studied? Is it not clear from your analysis of what precedes each one that all sensations of whatever kind are in your mind?

V. And *when* are they all? Has not every one that you have ever experienced been in the present? The burn which I remember *now* to have had a moment ago was *present* then.

VI. We are naïvely conscious of objects as units, or wholes only, until our attention is called to the fact that all objects are groups of sensations.

PRESENTATION STEP.— I. What sensations does it take to make the pencil in your hand?

You say it takes color sensations of red, brown, gray; sensations of touch and resistance, smoothness, weight, and

the peculiar pressure of rubber; smell sensations of cedar and rubber; flavor sensations of cedar.

That you may have sensations, consciousness of difference is necessary. But given the sensations you have named above, that is, just the results in mind of colors, touches, tastes, and smells, you could not make the pencil. In order to make it the sensations, in addition, must be grouped in time and space relations. That is, there must be a consciousness of whereness and whenness, or time and space, in which the sensations are definitely grouped. The red of this group, for example, is not out in the street yesterday, but in a certain definite relation to the grays and browns to make the single complex, my pencil, now.

II. Analyze many objects following the order indicated above:

1. Name the sensations that make the object for the moment;

2. In order to have these elements, there must be a consciousness of each sensation as different from the immediately preceding one;

3. In order to have perception, time and space must be thought;

4. The sensations must be realized as definitely grouped, associated, or synthesized in times and spaces to make objects, wholes, units.

III. The above order does not imply that our original experience is at first made of singular elements, that is, that in childhood we have only sensations, that then for a time we are conscious of the sensations in time and space, and finally in definite time and space relations.

Nor does it imply that in making my shears I have at one moment sensations, at the next, consciousness of space, and so on. My experience from the beginning is of undistin-

guished and undiscriminated complexity. I know my shears not as a group of sensations but as a single object.

But though these different steps are not chronologically successive, in the process of analyzing perception as a psychological fact they must be considered as logically successive and in the above definite order. That is, we cannot think of sensations as grouped till we can think time and space in which to group them. Nor can we think time and space before we think sensations to limit them. Nor again, can we know sensations in undifferentiated continuum. Though in experience the three steps are a simultaneous synthesis, in analyzing each object logically one must think them as we have outlined them.

IV. We are not concerned here with the origin of the ideas of difference, time, space, and grouping. We have only to notice these forms as characteristic of all the sensations that make the outer world, many of the parts of which you have named and analyzed.

V. All the parts of your physical world, all the congeries of objects you have thought of and named are at any and all moments made of sensuous elements.

VI. The process of making our outer world out of sensations in time and space relations is perception.

APPLICATION STEP.—I. It is somewhat difficult to realize that anything so complicated as our experience of the outer world is really made out of sensation stuff. I must beg of you to dwell patiently on the analysis of objects and acts of all kinds and to try to realize that these same sensations are the vague undifferentiated matrix out of which all the richness of the qualitative variety in our world is elaborated.

II. What is the difference between the sensation red and the perception red of my pencil?

The sensation red is the result in mind of the excitation of brain cells, the perception is the red-of-the-pencil-now-in-my-hand.

That is, the presentative element of my experience is the sensation, and this sensation-in-its-time-and-space-relations is the percept.

So far as we can think we never have sensations that have not a "whereness" and a "whenness," that is, that are not at the same time perceptions.

III. You formerly thought perhaps of the "percept" of the pencil as a fixed, unchangeable, static entity, which came to mind whenever you needed it, a group of sensations that you carried about with you always the same. A little reflection on the objects of your world, however, will show you that you probably never have two thoughts of an object just alike, or two groups of sensations that are exactly similar. There seems indeed to be nothing static about consciousness.

Since my "percept" is really a small part of the process of perception, the indefinitely rapid grouping of sensations in time and space relations, the term is a needless distinction in psychology.

IV. The stream of thought must not be understood to mean merely the superficial thoughts that flit through the mind. Since will action is one of its aspects, we have to realize that at any moment our acts are groups of sensations. For the muscles and other parts of the body are known and controlled only in the terms of mind.

V. Analyze from the standpoint of perception many movements of different parts of the body in the terms of joint, tendon, and muscular sensations. After you have made a thorough concrete study of the effects of insensibility in the joints and tendons of the ankles, knees, waist and backbone, neck, shoulder, elbow, wrist, hand, and fin-

gers, you will have a clearer idea of muscular movement as groups of sensations.

LESSON II

THE OUTER AND INNER ORDERS OF THE STREAM OF THOUGHT

PREPARATION STEP.—I. Imagine the cone of a searchlight on the nightboat, for example, as it sweeps over the city of Albany and the banks of the Hudson River. In the darkness the city does not exist in the terms of color. The searchlight, when it flashes out, makes the streets, buildings, and trees in the terms of greens, grays, browns, and reds.

II. In your trains of association you have found all members after the first to be recalled, or secondary. These secondary members form your inner world,—that part of your experience that no one else shares with you.

III. Ask someone to think of the color of the building in which you are: How are you ever going to find out of what he is thinking? You can never by any possibility get inside his mind to find out, certainly.

IV. You no doubt remember having learned in physics that the rainbow you see is not the same one that your neighbor makes. Think about this fact and study out its explanation.

V. The stream of thought is a succession of outer and inner experiences. Of which do you have a greater number, first members or subsequent members in the trains of association?

VI. Notice that the inner groups like the outer, physical ones are made out of sensations as elements. Analyze these secondary groups in the same way that you have analyzed those of the outer order.

VII. Recall the pencil you analyzed in the last lesson. Image as vividly as you can the colors, pressures, touches,

and tastes that were primary then. How does the recalled color brown that you think of now differ from the primary brown of the pencil itself?

The secondary brown is not so distinct as the primary, it is not so intense or lasting.

Study as you may this and other sensations, about the only differences you can find between outer and inner sensations are those in intensity and duration; and these differences are not always present.

VIII. Sensations, whether they are primary or secondary, are the result in mind of cerebral excitation.

PRESENTATION STEP.—I. What sensations does it take to make your paper? It takes grays, blues, reds, smoothness, and pressure in certain definite grouping in time and space.

II. Now if all these grouped sensations that you have named were taken away, what would there be left?

"Why the paper, the matter," you say.

But weight is one of the sensations we took away—and all the other properties of matter can be shown to be only more or less complex groups of sensations. All that we know of matter indeed is its properties, and they are all in the terms of mind.

III. Think of your consciousness as like the searchlight in its action. In the darkness the city does not exist in the terms of color. The light literally makes all of it that we see out of greens, grays, browns, and reds of varying degrees of brightness.

So the mind seems to make the paper out of sensations, not of color alone, but of all kinds.

(Psychology is not concerned with the consideration as to whether there is an extra-mental duplicate of the outer world always existing or with what there is "left" when sensations are not existing.

Different theories of metaphysics, however, have assumed that there is something aside from mind, a "permanent potentiality of matter," a "world-mind" or a "*ding an sich.*" Still another theory teaches that mind is governed by unchangeable, universal laws, according to which I and everyone else under like circumstances can make the paper. Read B. P. Bown: "Metaphysics," pp. 407 ff.).

IV. And thus the mind of each person makes not only the paper as it is needed, but all the physical, "describable" world of city, country, the earth, the "heavens, and all that in them is."

There must be, moreover, as many papers, as many worlds, as many spaces as there are minds, but in some way we think of our outer, describable world as always existing, one hard and fast physical world, shared by all alike and alike for all.

(Astounding and incomprehensible as the fact that nothing thinkable is left of matter if no mind makes it at first seems, do not fear or fail to realize it literally and absolutely. A clear comprehension of the metaphysics of it is a great help to an understanding of the psychology of perception.)

VI. Our outer world, then, is made up of sensations in time and space relations. This outer world, moreover, can be distinguished from our inner world only by the grouping of the sensations. The group that for the moment makes my pencil fits in with the stream of sensations that has been distinguished as my outer order always. A recalled image of the pencil that I may have later will not belong to the then outer order, but it will "dovetail" in with the inner order.

VII. We have come in some way that we cannot now determine to form the habit of making out of sensations the same in kind without confusion the two orders of our life, outer and inner, "physical" and "mental,"—two orders

apparently different with now one present and again the other, yet forming a single stream of thought.

APPLICATION STEP.—I. Though most psychologists admit that the sensuous material of the outer and the inner order is qualitatively one and the same, it is customary to limit the application of the term perception to the formation of the outer order.

There seems to be no difference in kind, however, on which to base this distinction.

The question is of importance here only when one strives to realize that the whole stream of thought is the action and interaction of sensations the same in kind.

II. Groups of sensations may be now of the inner order, now of the outer, and again mixed, or fused. Of the different groups that are my pencil, for example, one may be at the same time an object, the first member of a train of association; another of the inner order only. The group always has enough sensations that have been in my mind before with the thought, "my pencil," so that I can recognize it each time.

I have as many different "perceptions" of the pencil, then, as I have experiences with it or thoughts about it.

III. Is it not strange that though the secondary members of trains of association, that is, inner thoughts outnumber outer ones overwhelmingly, is it not strange, that, as one thinks over uncritically the last hour it seems to be made up of outer experiences only?

IV. What parts of your world do you habitually make in the terms of taste, smell, touch, resistance, and temperature sensations? In the terms of touch and resistance sensations? In what terms do you think of the inside of the toe of your boot? Of your hat on your head? Of the inside of your pocket?

V. The stream of thought, whatever else it is, seems to be the "epiphenomenon" of the brain condition, and this condition is a resultant blended of all the factors of the present stimuli as modified by the brain's past history, individual, ancestral, and racial.

"All we know of submaximal nerve-irritations, and of the summation of apparently ineffective stimuli, tends to show * * * that presumably *no* changes in the brain are bare of psychological result." (James, "Psychology," Vol. I.)

VI. Do you see that each person makes not only his own rainbow, but in just the same way, his own house, city, world, body, acts, friends, everything?

Dwell on the fact of how individual a matter a mind is. "No man" indeed "knoweth the things of a man save the spirit of the man that is in him."

VII. Can we ever really know another person? Every one about us is for us body and soul, our own creation and construction.

What the incitement is that makes us make different people as we do is a question with which we are not here concerned. The important matter is the comprehension of the fact that we do so make them.

VIII. To the ordinary consciousness there is the mind within and the great world of hard and fast facts outside. And to the psychologist the same is true, except that the psychologist realizes that both are made of the same kind of stuff.

The fact that the outer order is mental should not make it seem any the less real, stable, reliant, orderly. It is never capricious. Since it is as I make it, I might think that, if I wished, I could have a goldpiece in my hand now. I must not think it, however, for no matter how hard I try, my imagination will not make it there as a group of sensations

fitting in with my present outer order. I know as a result of lifelong experience what must be in my physical world, and ordinarily I do not try to make other things there.

IX. By the processes of perception and thought each individual guided by the discoverer builds up and formulates for himself the sciences of physics, astronomy, and all other groups of classified knowledge, out of this world that we make. We can never get outside our minds to find out what the laws that govern us really are—they are as unattainable as Plato's "types laid up in heaven," or as the German "things in themselves," but the sciences that are formulated are the human mind's best guesses at these laws and attempts to classify them.

LESSON III

INFERENCES IN PERCEPTION

PREPARATION STEP.—Some of the inferences that have been assumed in the study of perception should be made explicit.

I. Notice some of the facts that you say you see in connection with the space relations of objects: You say you see that the reading-glass is round; that its lense is curved; its handle cylindrical; that it is large. You "see" that the shears are pointed; that the book has angles; that the table is round. You "see" that the window-seat is two feet wide; that the wall is ten feet distant; that there is space between the houses across the street.

You "see," also, that it rains; that the car moves; that the wind blows; that the bread is done; that the reading-glass is made of wood, nickel, and glass; that the table is polished; that fruit looks good; that a friend looks ill.

A little thought will show you that you do not literally see one of these things.

II. You say that you hear a car passing in the street; that you hear your name called; that you hear a person say that it rains.

And here again you do not literally say what you mean.

III. The perspective of scenery in the theatre, the frescoes on the walls of many buildings, deceive us easily,—the distance is inferred from the representation of depth on a flat surface.

IV. I heard some music yesterday. To-day is a holiday, but to-morrow will not be a holiday. Last year at this time there was snow on the ground. I am going to the play Saturday night, and it is now Monday.

These events are all thought of as belonging to a more or less definite time.

V. Go over your own thoughts tracing the trains of association involved in experiences similar to those given above; for example, (1). A group of colors; (2. Thought words) It rains.—(1). A group of sounds; (2. Thought words) It rains.—(1). A group of temperature and pressure sensations; (2. Thought words) It rains.

You would ordinarily say in these cases, first, "I see that it rains;" second, "I hear it rain," and third, "I feel the rain."

PRESENTATION STEP.—I. When one says that he sees that the knife is sharp, what does he really see? Is sharpness a result in mind from the excitation of the optic nerve? Of course not. It is a result of the excitation of the nerves of touch.

In this person's mind a certain group of color sensations, (steel color, lustre, grays) that has been in consciousness before with the touch sensations and the thought word, sharp, is now followed by the same thoughts. Therefore he says that he "sees" that the knife is sharp.

In the same way he may infer by association from a group of colors that the lamp is spherical; that it is two feet distant; that it is in front of him; that it is symmetrical, graceful in shape; that it is one yard from the window. He may infer by associations before established with a group of sound sensations that the can of the lamp is filled; that the shade is of glass; that it is near and in front of him.

Practically all our knowledge of space relations, such as the distance, direction, extent of movement, shape, size, and position of objects is a matter of the association of touch, muscular sensations, colors, and sounds among themselves and with words.

II. I say that I heard my name spoken. What I really heard was a group of sound sensations only. These by previously established association were followed by the thought word, "Cousin."

Thus it is with all language we hear spoken. It is only sounds, absolutely meaningless except as we supply meaning by association. In reading, also, all that we see is color sensations,—we must supply all the thoughts.

III. We also associate with color, sound, and touch groups, the names of objects, materials, qualities, quantities, acts, events to a degree incredible to us until we have made a study of these inferences.

IV. How do I know that the music I heard yesterday was sung yesterday and not two years ago?

I know that I heard it yesterday because every hour not only of yesterday, but of my whole life has been known as time only by being filled with events, groups of sensuous elements, my stream of thought. Whatever time has not been filled has not existed for me.

The stream of thought that made the time of yesterday has in many places the thought of Christmas Day, not Saturday. Nor do I go to church on Friday. Two years ago

I went to church, but I did not hear the Neidlinger Carol sung. The group of sounds that makes the music fits in with other sensations, that, all together, make the duration of yesterday, sensations, any part of which I recognize or recall as belonging to yesterday.

In five days it will be New Year's Day. The ideas that make that day do not fit in with any that have made an outer order in the past, therefore I judge that it will be in the future.

The actual present, the meeting-place between the past and the future, has no duration. We know an event as present, in the same way that we know the past and the future, from the relations of ideas.

All our knowledge of time relations, that is, time, rhythm, frequency, rate is a matter of the association of ideas.

V. Thus we see that only a small part of our so-called knowledge of the outer world is direct perception. Following primary sensations there flash into our minds associations about space and time relations as well as a bewildering multiplicity of identifying associations that make the primary sensations usable by us.

APPLICATION STEP.—I. Watch the experience of a child in learning distances and shapes, that is, in establishing associations among groups of colors, touches, arm's lengths, paces, and words.

I know a child who cried for the moon. She really thought it was against the window. Certain colors had been in her mind before with the ten-paces-distant window, so that a visual image of these colors again was followed by the inference that the moon was in the window.

A man told me that when he was a little chap he lived where he could see railway trains cross a river bridge at

some distance from his home. These trains, of course, looked small to him though they did not seem far away. They later passed his home, but he could not see where the tracks turned, and so did not know that they, the cars, were the same.

He often wondered, he said, why those little trains that he saw on the bridge, trains like the toy-cars he dragged around the yard after him, never came by his house. You see he had not associated the distance of six city blocks with the sight complexes that made the trains on the bridge.

Try to realize by constant concrete observation how complex a composite the space relations of your outer world that you have built up hour by hour since childhood—try to realize how complex a composite these relations are.

II. What advantage would it be to us to be more accurate and adequate in our associations of space measurements? to estimate, for example, at a glance the size of the park as seventy acres; to be able to imagine how an animal five feet high would look; a fall of water two hundred feet high; a mountain 5000 feet high, a bird four inches long.

III. As we grow up and grow older the function of primary sensations becomes more and more merely to "touch off" the complexes. Only a few elements of our experience are of the outer order; the rest of a group is supplied from the inner order.

A good example of this fact is our experience in reading: Cover the lower half of a line of print and read it. Then cover the upper half of another line and read it.

Which of the two did you read more readily? Unless your experience differs from that of others, you will have read the first more easily.

In hasty reading we form the habit of making only the tops of the letters as of the outer order and supplying the rest as secondary, though we are not conscious of this fact

till attention is called to it. Most adults would say that they see the whole word on the page. Because they so rarely do, children make better proof-readers than adults.

IV. It is thought that in early mental evolution consciousness was primary, all outer. As experience grew, secondary ideas appeared, and as they were found useful to supplement the primary experience their store increased. Lastly, as language developed, the mere symbol came to take the place of the group of sensations.

And as we grow older our stream of thought comes to be in some instances almost entirely in the terms of language.

V. Though ordinarily we make our inner and our outer order without confusion and with apparent truth, we are sometimes inadequate to our outer world. As we occasionally fill out the rest of a word or a sentence in reading incorrectly, so we make mistakes now and then in filling out other groups.

A young lady recently entered a room where she saw a small parcel done up in oiled paper. After a few minutes she said, "I smell violets. How sweet they are!" The flowers in the paper were odorless mountain daisies. There was perhaps about them some little fragrance of the green house, and Miss S. had completed the few outer elements—by secondary elements, so that she smelled violets distinctly.

VI. This odor was an illusion, and the experience may be taken as a type of illusions. It is probable that there are always some few sensations that touch off the complex, and perhaps far oftener than we realize, our perceptions are filled out in the wrong way.

Make a study of the extent to which emotions, desires, moods, the fixedness of an idea, and prepossessions influence our illusions.

VII. "The whole world of reality, as well as that of knowledge, may be considered as one system, embracing

within the unity of its totality all the various systems with their complicated parts. From this point of view everything bears relations to everything else in the universe."

"Inference (in higher thought) consists in interpreting the implications of the system to which the given in consciousness belongs."

"He only sees well who sees the whole in the parts and the parts in the whole."

A child at first sees only immediate relations. His chief business is the collection of material in which he feels only the more necessary and obvious connections. With advancing maturity he is able to feel relations more and more remote. "It is therefore the well-furnished mind which sees things as most widely related, and discerns the potential as well as the actual manifestation, which will prove the most fertile in accurate inference, in prophetic suggestion, and in inventive resource." (J. G. Hibben, "Inductive Logic.)

CHAPER IV

MEMORIES

LESSON I

RETENTION

PREPARATION STEP.—I. Recall a face that you saw yesterday on the street; image it vividly. Recall the sounds of a band that you heard last summer; the smell and flavor of the coffee that you drank for breakfast; the touch and pressure of fur that you wore at some particular time last winter; the temperature and organic sensations of the last over-heated room you entered; the sensations of a burn, an electric shock, a headache.

Recall at your leisure definite scenes and experiences in the terms of as many senses as possible from each year of your life as far back as you can remember. Take time to get a definite idea in each case and image each one vividly.

II. Notice that the secondary image of the face that you saw yesterday on the street, (as well as all the other secondary images recalled above) is a group of sensations definitely arranged, and that it has the definite time, space, and other relations to other groups that the primary image had.

One face, for example, that I recall having seen is that of a young woman: the flesh tints, a definite group of color sensations, are surrounded by the grays of her prematurely white hair; I recall that she wore a black suit; I saw her against the background of a shop window; the time was in the morning—and so on,—I may reproduce a large number of relations in which this particular visual image was set.

All the groups of sensations that you have recalled have, in the same way, the same settings that they had as primary groups.

III. The law of associations from the standpoint of brain-cells, you remember, states, that "brain-cells that have been excited together tend the more readily to fall into a like state of commotion when part of them is again excited."

The law describes the mode of action not of brain-cells alone, but of the elements of the whole body as well.

IV. Recall what your physiology taught you about the three parts of your brain. Point out as definitely as you can in your own skull the medulla oblongata, the cerebellum, and the cerebrum, and imagine their successive evolution from the spinal cord.

V. Matter, both inorganic and organic, is modified by every slightest change in it. The effects of every change, moreover, are permanent. In the case of bodily modification, where the elements are undergoing perpetual renewal, the form persists. An insignificant scar on the skin, for example, remains throughout life. An indefinite number of bodily changes too minute for the senses to detect yet in their effects last always.

PRESENTATION STEP.—I. Let us take for concrete study your memory of the music of a band that you heard last summer. Recall the sounds clearly, and get back as much of the setting as possible.

Where has this group of sound sensations been since that day?

"In my memory," you say.

But where is that? What do you think of when you think of your memory? Perhaps of a sort of receptacle filled with pigeon-holes. But where are the pigeon-holes of memory?

"In my mind," you say, "in unconsciousness or sub-consciousness."

But how do you know this fact? No one has ever been in his unconscious or sub-conscious mind to see that there is such a place.

Is it not, after all, in order to account for the presence of these sounds in your mind now that you are so sure that they have been somewhere? If, then, we can account for the secondary image of the music in some other way, you will no longer need to think of mental states as carried about in unconsciousness. And we can so account for the recalled sounds.

The only answer you can give, then, to the question where the sounds have been, is, "I don't know. They went out of existence, so far as I can tell, when they left my consciousness that day."

II. To understand how you can recall the music now, think of what took place that you might hear the sounds last summer: Vibrations reached and excited the auditory nerve, and this excitation was transmitted to brain-cells with the result in mind of the melody. Some one said to you, "Music in the Gardens—the band is playing." The entire group of sensations fitted together with others making a stream of thought, any part of which is recognized as last summer's experience.

III. When the brain-cells resulting in the thought words, "Music last summer," are now stimulated in connection with my request, according to the law of habit the cells that vibrated before with them are excited again with the result in mind of sound sensations like those you then heard.

Such is the process by which the secondary or "recalled" material of the stream of thought is made. For convenience in analysis, I shall classify the steps of the process loosely

as those of Retention, Reproduction, and Recognition. (The last two are considered in Lessons II and III.)

IV. First as to Retention: The word means *to keep, to hold from escape.* What is it that is kept, and where is it kept?

The sounds of the music when you ceased to be conscious of them, or forgot them went out of existence, so that they are not retained; the brain, however, has been so modified by the original stimulus that its cells have the disposition, when some of them are restimulated, to respond again in the same way as at first. The place of retention is, then, the brain.

And as to what is retained or kept, it is neither sensations nor mental states, but it is the tendency, or disposition of the elements of the body.

Retention, then, is a matter of the disposition of elements of the brain that have been modified together at some previous time, when a part of them is stimulated again to respond together.

APPLICATION STEP.—I. It is thought that retention (the physical tendencies) is perfect for everybody. Is it not strange, then, that we have so little use in thought of the great wealth of its stores? That we forget so much and so often?

II. A little closer approach to the problem of nerve and brain structure will show us something of the economy of forgetting.

The nerve cell, the ultimate center of nervous activities, is the storehouse of nervous energy. It is exceedingly minute in size and in almost infinite numbers composes the gray matter of the brain and spinal cord. This cell is a mass of protoplasm, grayish in color; it contains a nucleus

and branches out into infinitely numerous processes, or fibres of two kinds. Those of one kind, long and medullated are the afferent and efferent nerves; those of the other kind are short and non-medullated. Each central nerve cell, with its fibrillar offshoots, is an isolated entity.

As to the process of functioning, each filament jutting out from a cell is held to be a transmitter of impulses that operates intermittently, like a telephone wire that is not always "connected," and like that wire, the nerve fibril operates by contact and not by continuity. Under proper stimulation of nerves from the sense organ the ends of the fibrils reach out, come in contact with other end fibrils of other cells, and conduct their destined impulse. Again they retract, and communication ceases for the time between those particular cells. Fibrils thus connected, however, seem to retain the tendency to touch again on the occasion of a similar restimulus of one of them.

Meantime, by a different arrangement of the various conductors, different sets of cells are placed in communication, different associations of nervous impulses induced, different trains of thought result.

According to this conception "one can imagine, for example, by keeping in mind the flexible nerve prolongations, how new trains of thought may be engendered through novel associations of cells; how facility of thought or of action in certain directions is acquired through the habitual making of certain nerve-cell connections; how certain bits of knowledge may escape our memory, and refuse to be found for a time, because of a temporary incapacity of the nerve cells to make the proper connections; and so on indefinitely." (Henry Smith Williams, M. D. "The Century's Progress in Experimental Psychology."—*Harper's Magazine,* September, 1899. Read also, Henry Herbert Donaldson, "The Growth of the Brain.")

III. All writers on the subject are now agreed that there is no such thing as formal memory training. Nor is there any bump in the brain by enlarging which we can gain better or more retentive memories.

IV. If it is true, moreover, that the law of contiguity governs not only the brain, but also the entire physical structure, then the whole body as well as the brain is the seat of retention. In the human organism, however, excitation of the hemispheres is the essential cerebral condition of memory and foresight.

If all retention were obliterated in the cerebrum alone, one could recall no conscious sensations, none of the thoughts involved in higher intelligence and volition. If retention were obliterated in the cerebellum, also, one would have forgotten the co-ordination of muscular contraction. The staggering of drunkenness, for example, is due to the partial paralysis of the cerebellum.

In the medulla originate the nerves controlling the most vital functions of the body, so that if retention here were obliterated our nerves would forget to control the lungs for breathing and to beat the heart, thus life could not continue.

The fact is practically established that in fatigue, brain-fag, and with advancing years it is the sensitive higher centres that are atrophied first. The tendencies that have been longest established are, in general, retained most persistently.

V. Make a study of habits. The effect of repetition is to establish in the body dispositions, or tendencies to ever more ready response to a given stimulus with constant fading of the accompanying mentality, so that, in time, our nerves and muscles alone do many things for us that before required consciousness.

VI. Make a study of the relation between retention and heredity.

Heredity has been defined as race-retention. By it modes of structure in a parent organism are transmitted to the offspring, in the sense that (according to one theory of heredity) a tendency is imparted to embryonic cell structure to grow and develop into a structure like that of the parents.

A member of a given family, no matter where he is brought up, will have the physical characteristics of his progenitors. The results in mind of the stimulus of similar organisms must be similar, and so one hears the remark that "Mary has her mother's disposition," or "John has his grandfather's orderly ways."

Trace the evolution of the human body; of the brain and special senses.

"Each present brain-state is a record in which the eye of Omniscience might read all the foregone history of its owner." (James, "Psychology," Vol. I.)

"The whole nervous system is a single organ of sensation and its present state is a history of its life and the life of its progenitors."

VII. It has been said that the children of uneducated races have to learn anew from the beginning; those of educated races have but to remember. What does the saying mean?

LESSON II

REPRODUCTION

PREPARATION STEP.—I. If one has only the passive modifications of the body, retention, he has nothing in his mind, he is not thinking. Another step is necessary in order to think, that of Reproduction.

II. Recall events that occurred when you were a child: Did you ever move from one house to another? From one city or place to another? What do you recall of houses, gardens, journeys, frocks, people, voices, plays, games?

What do you remember of your first day at school? Of early schoolrooms and teachers?

Recall early fears, as of the dark, getting lost, falling from high places, smothering.

Can you recall among these early experiences many that are made of sound sensations? Of organic, muscular, smell, or temperature sensations?

III. I am thinking of a fireboard that I saw when I was a child. Retention has made it possible for me to keep the tendency then established in the brain cells to a certain sort of excitation. Let us say the line of excitation as shown by the resulting train of association is somewhat like this: a′ b′ c′ d′ and the train of association in mind, a. Visual image of paper; b. I must write more reminiscences; c. I have often recalled Grandfather's house; d. Visual image of the fireboard there.

IV. The result in mind of the excitation of brain cells, no matter how, is sensation. That is, the brain cells may be stimulated from the nerves and end organs, or, on the other hand, they may be excited in the course of associations. The result in mind is apparently the same in kind in both cases, a sensation.

PRESENTATION STEP.—I. The picture on the fireboard is a group of sensations, blues, reds, and grays, representing two children playing by a stream. For some reason it appealed to my childish imagination and I have always remembered it.

These colors result in mind now from the stimulus of the same brain-cells that were excited when I saw it. The commotion is set up in them according to the law of habit. Let a′, b′, c′, and d′ represent the groups of brain cells involved

and the order of their stimulus. I say that I reproduce the visual image of the fireboard in its place d among the secondary members of a train of associations, each member of which is the result in mind of the restimulus respectively of a′, b′, c′, d′, which are now vibrating according to the law of associations.

To reproduce means *to form again.* The "reproduced" image, a result in mind of the restimulus of the same brain elements, seems really to be created anew each time we think of the experience.

Reproduction is the process of restimulating certain brain-cells on the occasion of the re-excitation of brain-cells that were stimulated with them before, with a result in mind of sensations similar to those then experienced.

APPLICATION STEP.—I. Compare the reproduced images with the primary ones as to size, duration, clearness, distinctness, adequacy.

II. Animals retain experience only in accordance with the complexity of their structure,—thus they have not the power of free recall that enables the complex human mind to think, reflect, and act.

III. One reason why we forget may be in the fact that the nerve cells are incapacitated to make proper connections.

But there are certain indications that our inability to "recall" desired mental states is not always due to defective retention. The hypnotist, for example, has the art to cause his subject to repursue even lightly established paths of associations, such as would not result in mind ordinarily.

Records of prodigies of memory performed by persons in delirium and impossible to ordinary consciousness also show the perfection even in severe illness of retention in

the nerve cells. Such facts as these seem to indicate that one cause of difficulty in recalling is in the process of stimulating the brain paths.

Schools, moreover, force us to "learn" so much material and to learn it so rapidly that only few and fleeting tendencies are established, and as a result we cannot find "cues" from the side of consciousness to start lines of stimulation.

It seems probable that in proportion as mental effort in learning is merely formal, mechanical, or as it fails to involve interests, instincts, and dynamic factors in us, it blunts, instead of develops, the power to establish and to use the stores of retention and the consequent ability to think and act.

IV. The body seems to go on doing work for us when the mind is not discriminating the thoughts. If we study to learn a song or a piece of poetry at night, even though we cannot remember to have recited it through the night, we can reproduce it in the morning more perfectly than we could when we left it last the night before. It is noticeable that in the spring one can ride a wheel, for example, better than one could at the close of the autumn before. The Germans have a proverb which says that "we learn to swim in the winter and to skate in the summer."

These and kindred phenomena have been explained by the theory that the blood circulating in the tracts where association paths have been lightly established confirms these paths by refreshing and nourishing the cells. Thus the body working without explicit direction of the mind gains skill for us.

V. The study of children shows that during the periods of infancy and childhood muscular co-ordination and mental development proceed hand in hand.

In right-handed people many more co-ordinations of mus-

cles are established on the right side of the body than on the left side. It is also true that more thinking is done with the left hemisphere of the brain, which is the one that controls the right side of the body, than with the right.

It is inferred from facts like these that perfect and complete muscular co-ordination exercises a profound influence on the development of the mind.

This theory is one of the strongest arguments advanced for the introduction in schools of the right sort of manual training and all around physical training.

VI. Suppose we could read the modifications of other people's brains and nervous systems. We might know all they thought, indeed be within their mind—a tempting conception to fiction. This fascinating accomplishment of sharing each others thoughts was possessed, you remember, by Peter Ibbetson and the Duchess. And Grant Allen wrote the tale of a youth who read consciously not only the brain records of other people, but also those remains established in his own organism by heredity from ancestors all the way back to the "hairy anthropoids on the jungle-clad banks of some tropical stream!"

VII. Notice how subtle some of our ways of communication are. We say that "a glance spoke volumes." "The turn of a hair," the contraction of a muscle, a fleeting expression of the face may tell us a great deal. No doubt much that masks under the name of telepathy can be explained in the terms of the senses and associations.

VIII. When we think of it, all we know and are at any moment, all there is of any individual is just an infinitely complex succession of related sensations, a stream of thought, a constantly shifting present. Yet, in a sense, all one's life is now completely present; try to realize anew that the mental condition of this moment is the complete history of one's past, individual, ancestral, and racial.

IX. Make a study in this connection of the responsibility of teachers in the matter of training children and establishing in them lofty and effective ideals.

LESSON III

RECOGNITION

PREPARATION STEP.—I. Recall some recent time when you walked in the street; rode on a car, a train; glanced in a shop-window; asked a question; shook hands with some one; talked of the weather; dined out. Recall the best time you have had recently.

Image vividly the above experiences and analyze quickly the processes of association, retention, and reproduction by which it is possible for you to think each one.

They are each and all groups of secondary sensations in time and space relations, the results in mind of the restimulus of brain-cells according to tendencies formerly established.

II. With us all a great part of our daily experiences is never recalled. We remember what we need and the rest, though permanent in its influence, is lost in time to conscious recall.

PRESENTATION STEP.—Suppose for a minute that your thoughts came back in wrong time and space relations: that your recent "best time" was placed, say, in a dentist's chair instead of in a pew; that the last dinner out seemed to have been on Christmas Day instead of on New Year's Day; that it was thought of as at a hotel instead of at a friend's home; that a song sung to you was recalled as addressed to some one else.

With relationships changed in this way, should you recognize your "best time" or your last dinner out? Of course

you could not. Each group must be reinstated in its former relations to seem familiar. The last dinner out, say, must be thought of as on New Year's Day at Dr. B's with Miss B., her father, mother, and Mlle I. only present. It was in the evening in a certain room and was followed by some music.

And not only must the groups "dove-tail" with other groups but the sensations of each group must be reinstated in the same relations as before that we may know it again as a former experience. Professor James somewhere says that something seems "to click" when we recognize a thought.

The color and other sensations that make the people, the lighted table, the flowers, the dishes, and the food must all be grouped in the same time and space relations (and logical relations, or correlations, also) as formerly. The effect of all this reinstating of the elements of secondary experience is that you recognize these ideas as the reproduction of your experience the last time you dined out.

The feeling of familiarity in the process of reinstating sensations in their former relations is Recognition.

APPLICATION STEP.—I. One caution should be observed in your practice in analyzing memories, namely, do not confuse the steps: Retention is not reproduction, nor is it recognition. Reproduction is not recognition. Each step is logically distinct.

II. Analyze your memories of many secondary thoughts daily somewhat in this way: I recall band music that I heard last summer. In order that I might hear it then, vibrations from the instruments set the air in motion, this motion reached my ears, and excited my auditory nerve and successive brain-cells, with the result in mind of a melody played by a band. In order that I may think the same mel-

ody now, the same brain-cells must be excited again. They are now excited in accordance with the law of habit, and the following mental states result in my stream of thought: (a) I saw my paper, (b) I thought I must write one complete analysis of memories, (c) I'll use the "band music," (d) secondary sounds of band music, (e) secondary visual image of a park and people. The elements of the secondary sounds are reinstated in their former relations, these groups fit in with those of the scenes and people, and I recognize the tune as that played by the Highland Band in West Princes Street Gardens last summer.

Retention was in the tendency of my brain-cells to be active as they were last summer even though I am no longer in Edinboro.

The process of restimulating those brain-cells because others now active were active with them then, with the result in mind of exactly similar sound sensations is Reproduction.

The feeling accompanying the process of reinstating the sensations in their former relations is Recognition.

(I must ask you to pardon so much repetition—but my excuse for it is that it is only in the constant analysis of different mental experiences that one can become familiar with the facts of psychology. I can promise you that the longer you work at it the more fascinating it becomes.)

III. Recognition is a relative matter. There are all degrees of reinstatement of sensations in their former relations, hence all degrees of recognition. I hummed to myself, for example, the other day vaguely part of an air. It came to my mind several times afterward, when more and more sensations were reinstated and I decided that it was Gluck's aria, *Euridice*. I kept at work recalling more and more about it and reinstating all the material in its former relations, till I had the relatively complete recognition of

the aria as sung by Miss W. at the D. Club at Miss M's house three years ago.

Thus all thought is characterized by different degrees of recognition from the vaguest, most fleeting recognition that the object before one is a child, not a chair—to the complete consciousness of all that is known of the given image.

IV. Though the recognition of secondary experience only has been spoken of, the recognition of primary groups of sensations is a process the same in kind.

V. The parts of all thought as it flows along are associated with other parts, consequently recognized. An isolated thought is unthinkable.

The fact that our mental life is coherent is perhaps the basis of our feeling of selfhood.

It is by recognition through association that objects and experiences have meaning for us. "When a complex process holds together it has meaning."

VI. Reproduction and Recognition in memory are just the process of Perception looked at from the aspect of the inner order.

VII. The evolution of the process of recognition is interesting:

"The mood of at-homeness or confidence is a weakened form of the emotion of relief. Fear of strange things and strange people is instinctive with man; and it is a survival of fear unfulfilled, of relief, that we experience when we recognize * * *. It follows that every recognition is inherently pleasant. Oftentimes, it is true, the pleasantness of the at-home mood is outweighed by the unpleasantness of the associated ideas: we may recognize a person whom we particularly want to avoid." ("A Primer of Psychology," E. B. Titchener.)

LESSON IV

MEMORY TRAINING

PREPARATION STEP.—I. It is the commonly accepted opinion that there is no such thing as formal memory training. To apply the generalizations of these lessons, however, to many particular cases, to look at mental life from many standpoints is desirable. And there are still several considerations of interest in connection with memories, which, with no implications as to formal training, can well be grouped under the above general head.

II Why should one have a good memory?

To have forgotten, say, the experiences of all the forenoons of one's life would be manifestly inconvenient. Think how much this loss would have troubled you to-day about the house, in the street, in all your relationships. But it would be more than inconvenient.

Forgetfulness is fatal, in proportion as one suffers from it, to the attainment of his ideals, to his power of accomplishment. It is not what one has in his note-books, or what he knows where to find in books of reference or from people, but what is available at the moment from his own potential mental store, what he can remember in the terms of thought and muscles that gives him ability, power to do. In fact, one measure of a person's ability at any moment is the readiness with which he has the use of his past experience. In a sense we are limited in what we would do to what our memories of the past enable us to do.

It is quite important, then, that one have potentially available all the wealth of knowledge in right relations and of muscular co-ordinations of his past that will make him a wise and capable man, or, in other words, that he have "a good memory."

III. What are the qualities of a good memory? If you could have your wish, what qualities would you choose?

It would be of advantage to have a memory that is tenacious, retentive, ready, spontaneous, vivid, accurate, detailed, logical for some facts, mechanical for others—such are a few qualities usually named as belonging to a good memory.

IV. In what respects is your memory good? In what, poor? Analyze it critically.

V. Recall the loudest sound that you ever heard; the brightest light. In an experience with many students I have seldom found one who could recall these conditions.

At first thought one is likely to say that intensity of sensations makes the difference in our memory for them. It is doubtful, however, whether it does.

VI. Observe from concrete instances what difference conditions of rest and fatigue make in your memories; health and sickness; youth and age.

VII. What subjects did you like best in school and college? How many memories have you of these as compared with other subjects?

PRESENTATION STEP.—I. Though one speaks of his memory as if it were a faculty separate from mental content, there is really no such general faculty. You must see from your observation that what we have is *memories* rather than *memory*.

II. Pick out the facts that you have remembered all your life, that have come back whenever you needed them, and analyze them to find the reason why you have remembered them so well:

Let us say, a long time ago when you were away from home some one said to you, "Your house burned to the ground last night." You did not have to repeat that fact

ten times in order to remember it, or to have it written on the black-board or in your note-book.

Notice the knowledge, the associations involved to make this fact, "your house burned to the ground last night." The thought of your home is a part of many complexes. You can hardly start out to think on any subject that you do not come upon some thought of the house, the occupants, rooms, furniture, books, pictures, sounds, occupations, interests, pleasures, and sorrows connected with it. You know that "burned to the ground" means complete destruction; that last night is a definite past time. All this wealth of material is brought into new relations, rearranged to make the reality, "My home was burned to the ground last night."

Suppose, again, I could tell you, and it would be true, "You are the heir to a million dollars." I should not need to give you a text-book to explain the fact, or to keep you after school to be sure that you would remember it till examination time.

Thoughts of denials, missed opportunities, what you would do for yourself and others if you had more money,—there is much material here, too, to make into the idea, "I am the heir to a million dollars."

Both these thoughts would thus be inevitably in many trains of association; they would be interesting, because each involves a large amount of related material.

That which is in many trains of association, interesting, made out of rich material is best remembered. The memory for such facts is retentitive, and the facts are available when needed.

III. So much for the nature of the mental material involved to secure retentive memories.

A second matter of great importance in remembering facts is that of the relations between them.

Science is classified knowledge, and it is with this kind that schools are concerned.

"The best possible sort of system into which to weave an object, mentally, is a *rational* system, or what is called a science. Place the thing in its pigeon-hole in a classificatory series; explain it logically by its causes, and deduce from it its necessary effects * * *. A science is thus the greatest of labor-saving contrivances. It relieves the memory of an immense number of details, replacing, as it does, merely contiguous associations by the logical ones of identity, similarity, or analogy." (James, "Talks to Teachers.")

But learning sciences in the right way is only another way of describing the process of mental growth. It is indeed literally true that "the only way to improve the memory is to improve the mind."

APPLICATION STEP.—I. What can one do to improve a poor memory?

Misled by the fallacy of formal training, many people begin to study systems designed to improve the memory. These systems are usually adaptations of Professor Edward Pick's work on memories. They are often helpful to the untrained as they suggest new and ingenious kinds of associations, they classify material, and stimulate an inert mind to more vigorous effort. With the same amount of work, however, expended in the search for logical relations, for scientific classification, the results would be, no doubt, more satisfactory. The mechanical parts of memory systems "may sometimes be crutches, but in the end we have to carry our crutches."

II. As for helping one's self to remember the many small matters of daily tasks, one forgets here largely because he is not willing to work hard enough to remember,

to go through the drudgery involved in always remembering. Though much sentimentality is wasted in vain wishes for a "good memory," we are not enough in earnest to give the persistent, constant thought necessary to remember to mail letters and to do trivial errands in the time of them, until perhaps some day we wake up quite helpless in these matters and almost beyond improvement.

Mme. D., a well-known teacher of physical culture, is wont to tell her would-be patient of the indolent type, "I can do nothing for you, you have no mind!" What she means is that the luckless applicant has not sufficient will power, control, to work at her exercises daily, hourly, patiently, and persistently forever!

And in remembering the trivial requirements of daily life it is, in the same way, largely a matter of control, of "keeping up the loose ends," of the ingrained habit of a lifetime of doing the thing that ought to be done when it ought to be done, of being responsible.

III. Suppose you forgot all the subjects that you studied in, for example, the high school; suppose that literally all traces there made in the brain-cells and nerves were obliterated: Could you learn the same subjects more readily a second time? Under these conditions, surely not.

Suppose, again, that only a few of the brain tendencies were obliterated—those established, let us say, by your study of arithmetic: Could you learn algebra again as easily as you did at first? Or with geography forgotten, could you learn history as easily? It seems to be true that one school subject is a help, a mental discipline for another in proportion as the two use the same brain paths, or as they have material in common. We literally "learn with all we have learned."

But the matter of mental discipline involves more than learning as it is generally understood. We seem to be

limited in our ability to *do* to what we have done. Suppose for a third case, that a person forgot all his knowledge, all his mental content: how much ability to act would he have left? All the conceivable terms in which he does his thinking, planning, and executing are gone, and if there is any such thing as "formal discipline" left to help him, it is too attenuated and intangible a matter to be understood.

IV. Is it not truly appalling to think how much time is wasted in schools under this false notion that ability gained in the mechanical study of no matter what subjects is still transferable when the content is forgotten?

Perhaps this notion has arisen to justify formal, perfunctory ways of teaching. Luckily there is no place left in modern pedagogical ideals for formal teaching of any kind. Teachers are beginning to realize that, in proportion as learning is formal, it is stultifying. The great millennium, however, when there will be a proper appreciation of all the wealth of human culture that should be taught in schools and taught to be remembered and used in daily life, every fact of it, still seems very far away. Yet ideals are surely present that involve not memory for the sake of memory, but mental growth by the acquisition at the ripe time of knowledge in right relations, real growth in wisdom.

V. There is probably some one time in school life when each of the subjects usually taught in schools is most congenial, interesting, and readily understood. If the given subject were taught then, its facts would be retained and available for later resource and power. As most subjects are now taught, however, that is, out of place and formally, pupils have for them only a mechanical memory, which is likely to be but fleeting and irresponsible.

A whole science of teaching might be formulated (and much has been done) 1) from research in the contents of

children's minds and observation of their successive instinctive interests and tendencies as determining the time for specific teaching and training, and 2) from the establishment of right relations between different subjects and parts of the same subject taught.

VI. It is perhaps going too far to press the question, should anything be taught in schools that is not to be remembered?

Yet the only consistent answer psychologically is, No. Herbert Spencer showed in his chapter on "What Knowledge is of Most Worth?" the great value, necessity, even, in daily life, of the facts of many sciences, mathematics, and, in a measure, of history. An estimate of the wonderful value of the facts of history from a different standpoint is presented by the Herbartians.

Contrasted with all this wealth of knowledge for pleasure, guidance, and inspiration, the barren results of the formal book training for examinations common to some schools seem barren indeed.

It is often thought too much to require that one should be able to recall at any time for pleasure or use particular facts, "to pass an examination" on all one has learned in schools. Yet the daily requirements of life are our "examinations," the opportunities that we improve or miss depending on the availability of our wisdom,—these are the tests of memory and consequent power.

CHAPTER V

APPERCEPTION

LESSON I

DEFINITION OF APPERCEPTION

PREPARATION STEP.—I. Look through a kaleidoscope. What is the explanation of the figures that you see?

The instrument is usually a hollow prism lined with reflectors. Small pieces of glass are so confined at one end against a translucent disc as to move freely. The eye of the observer looks through the other end at these pieces of glass and their reflections. As the prism is turned or jarred slightly, with the constant rearrangement of perhaps only ten pieces of glass, figures of an almost infinite variety are formed.

II. Still think of the stream of thought, consciousness, as made up of sensations all the same in kind, some of which form the outer order (the first, or primary members of trains of associations), the rest of which form the inner order (the other members of trains of associations).

III. Think, also, of the sensations not as carried about in "memory," but as always a present result in mind of the stimulus of brain-cells,—the sensations primary when the stimulus is from the end organs, secondary when by the law of habit.

IV. The stream of thought is an individual matter. Ask several persons to sketch quickly the front of the building in which you are. Compare the drawings: Why should they be so different?

Pronounce to several persons the words Empire State, 2b, cobblestones, West Point: then ask each person what he thought when he heard each word. Why did not all think

of the same thing, the 2b, for example, that was in your mind?

Each one, you answer, gave the associations established by his past experience. If two of these persons had had the same past experiences, could they then have made exactly similar drawings, or would they have had the same associations? If they were brothers brought up always in the same family, would both think the same thought, have the same opinions?

It does not take much reflection to show you that to have thoughts that are really alike two persons must be more nearly similar than even brothers.

V. Let your imagination play for a moment on the problem under what circumstances two persons could have exactly similar thoughts, the same associations:

These persons must have had not only the same individual past, but also the same heredity; they must be the same as to their bodies, atom for atom and must have been always in the same place at the same time—but the conditions are getting beyond even imagination! And there are perhaps other factors not physical and not now calculable, that would still contribute to the difference in response that any two people make to apparently the same stimulus.

The present conditions, physical and mental, of each person are a resultant of his past, and the past for each individual is necessarily different from that of all others. Therefore the stream of thought is for each person an individual matter, and it is inconceivable that any two persons should have exactly similar associations and perceptions.

PRESENTATION STEP.—I. But if each person's present is the resultant of his past you will ask, do we never have an experience that is wholly new?

Think of something that seemed a wholly new experience and analyze it. Think, for example, of the last new book you read: you say you gained new thoughts from the book—did mental states fly through the air from the page to your mind? Surely not! In what sense is it, then, that you gained new thoughts?

Suppose you read the sentence, "For several years there has been an unmistakable diminution of the public interest in oratorio." All these words were known to you before, but not in just these relations. As you perceived each word or group of words it was followed by trains of association, and the sentence had meaning to you depending on the nature of these associations and their present relations. All you gained from the book, then, was what you brought to it somewhat rearranged.

Analysis of all so-called new experience will show that the content is invariably "old" or secondary, and that what is new is as invariably the arrangement.

II. But, you will ask, is there not in the beginning of life some wholly new experience? Suppose, in answer, that a person who has been totally blind to the age of twenty years suddenly receives his sight. He can see at first only what the structure of his eyes, optic nerve, and brain as determined by heredity and individual growth enables him to see.

There is never a time, moreover, when it is thinkable that something comes from without to within the mind, when something the elements of which at least were not potentially in the mind before is introduced.

And the colors and touches, even the primary ones that you make into the print of the book and the book itself; those, also, that the man formerly blind, or the little child makes into objects about him, instead of being something added to the mind from without it,—all are only those sen-

sations that the past of each, individual and racial, enables him to make out of components potentially there.

According to the theory of evolution an individual life cannot be isolated from parental and ancestral lives. As cell life in each organism develops, it is thinkable that constant readjustments of elemental mental conditions make possible in the course of time the stream of thought as we know it.

III. Think of the action of the mind as somewhat like that of the kaleidoscope, with the sensations corresponding to the pieces of glass. As the kaleidoscope is turned, new designs are formed that are the rearrangements of the same pieces of glass. Somewhat thus with each new stimulus, sensations created anew, yet secondary, for each moment of the present, take new relations, and these newly arranged groups make up the stream of thought at every moment. The mind, however, seems almost limitless in the number of its possible elements. Its possible combinations, also, seem infinite, and each new combination, because of memory, becomes a possibility, an added potentiality for future thought. The gain at each rearrangement, moreover, is not only in the complexity of material, the content, but also in the nature of the relations established. This last matter, however, is another story which you will study about from the standpoint of Thought.

IV. When we look at the stream of thought under the aspect of the rearrangement of secondary mental material into higher forms of relation, the standpoint is that of Apperception.

APPLICATION STEP.—I. With the idea in mind that each one's stream of thought from moment to moment is the progressive rearrangement of his own secondary mental material, think over again the conditions that would make

it conceivable for two persons to have exactly similar associations. Is it not remarkable that we are as much alike, even, as we seem to be?

Compare as to relative similarity your own thoughts and those of an Esquimo on the one hand, and, on the other, your own now with those that you had at ten years of age. Which two would be more nearly alike? Suggest other conditions for comparison.

II. In the terms of apperception what is the process of reading? When you read the statement about oratorio, a rapid series of associations followed every perceived word or group of words so far as you understood what you read. Secondary thoughts were brought together of which you had never before been conscious in this relation. When the first member of the trains of association is a written or printed word, the process of rearranging secondary material is reading.

III. Some one has said, "We do not judge a book, it judges us." What did he mean?

IV. The interpretation of character from the standpoint of apperception is a favorite study with authors—see, for example, Wilkie Collins' "The Moonstone," "The Schönberg-Cotta Family," Kate Douglas Wiggin's "The Affair at the Inn," Robert Browning's "The Ring and the Book."

In these books different persons relate the same series of events as each made them, thereby revealing each his own character.

LESSON II

LEARNING

PREPARATION STEP.—I. Take for analysis any random facts that you have learned to-day, such as 1) that it is possible to travel nearly all the way from Portland, Maine,

to Lincoln, Nebraska by trolley; 2) that there is a cemetery for dogs at Stratford-on-Avon; 3) that the Post Office Department of the United States does not pay, is not self-supporting; 4) that a child of three by his heroism in rescuing his baby sister from a burning house is a candidate for the Carnegie medal; 5) that the temperature this morning was 14 degrees below zero; 6) that you have a letter; and so on.

Since all mental action is apperceptive, these facts must have been made out of secondary material.

What did it take to make into each fact? Suppose one had never heard of Portland, or a trolley car—the first statement would not mean much. On the other hand, if you knew at least vaguely the direction and location of these cities, the distance by steam cars in hours between them, and in general, the route followed by trolley from place to place; if you knew what it means to ride through the country by trolley; if you knew perhaps that between two cities on the route in New York State there is no trolley line, if, I say, you had all this secondary material, you would have enough then to learn with ordinary intelligence the fact that you can travel nearly all the way from Portland to Lincoln by trolley.

Again, you knew what the condition is in a business that does not earn so much as it expends; you thought of the Post Office Department of the United States in the terms of visual images of the local Post Office, the postman, mail trains, and of thought words about collecting, transporting, and distributing the mail from city and country, and the complexity and cost of all this labor. Putting all these ideas together in new relations you learned that "the Post Office Department of the United States does not pay."

II. Hunt out the secondary material that it takes to learn many other facts that you have learned recently.

PRESENTATION STEP.—When we are looking at the process of rearranging secondary material in the stream of thought under the aspect of acquiring "new" ideas, the standpoint is that of Learning.

APPLICATION STEP.—I. From how much of our experience do we learn? Rearrangements are taking place every moment, and the first member of every train of association involves the bringing together of material that has never been together before. Clearly in spite of ourselves we must be learning all the time. Now you can sympathize with M. Jourdain's surprise when he found that he had been speaking prose all his life!

II. But though we are learning all the time, not all that we learn is of equal value. The ordinary haphazard acquisition of children outside of school is not usually estimated as very precious. In the case of school learning, however, the teachers' aim should be to cause pupils so to learn that the result will be systematized knowledge, science, available for daily use and pleasure,—knowledge, moreover, that as effective motives to lofty achievement in conduct vitalizes character, that stimulates to research for further knowledge, not only for self-realization, but also to add to the general sum of human achievement.

III. Suppose that the little chap who saved his sister's life was a member of your own family; that you were actually concerned in the administration of postal matters; that you were expecting a letter of great interest to you; that you had been over the route from Portland to Lincoln by steam cars, also from Lincoln to some eastern city perhaps by trolley. Would it make any difference in your learning of the facts? Would you comprehend them more intelligently than you do now? What difference would

these considerations make in your interest, in the number of associations, and consequent memory and availability of the facts? What, in the degree to which they are understood?

What difference in short, does the nature and amount of the secondary material rearranged in the process of learning make?

It makes all the difference in the world. In the degree that learning is formal, perfunctory, a matter of words and symbols, not involving a rich and full mental content is it deadening. On the other hand, to make the application to school learning, only as the act involves the greatest wealth of mental content, that is, the interests and dynamic factors instinctive to the different periods of a child's growth as he recapitulates race advancement, is it spontaneous and consequently educative.

IV. The systematic and scientific study of children has shifted emphasis from the problem of teaching to that of learning.

To find the contents of learners' minds, that is, their native interests, tendencies, and reactions has thus become the vital consideration for teachers. This matter disregarded, even though a teacher may be learned in his "subject matter," his work is weak in proportion; this matter determined, he has an intelligent guide to what, when, and how to teach.

"Knowledge of the subject-matter and a sense of humor" doubtless go a long way toward making a good teacher. Much good work has been done, moreover, empirically and through sympathy, but how much better work might teachers do, if at the same time that they have knowledge, a sense of humor, and warm sympathy, they could teach intelligently and scientifically!

The following vigorous protest against over-teaching makes one think seriously:

"Is pedagogy an art with a science at its foundation, or is it only a species of opportunism which should merely stand by and occasionally smooth out a difficulty, humbly conscious of the fact that all the motive force must come from the learner? In other words, can the teacher think for the pupil, or must the pupil do his own thinking? Is not the conventional relation of pupil and teacher a palpably artificial one, an irksome ligament which wears fearfully on both? Why, if this is not true, do so many children who love to learn hate school? and why are most teachers, especially most women teachers, sick, crabbed, and cynical? Has the modern method of substituting a ghastly imitation of play for work, and of feeding the pupil predigested knowledge, helped matters much? Why, then, did a rebellious kindergarten pupil recently announce that she wanted to get into the first grade at once, because she was so tired of having to play all the time, and wanted to learn something? Why should children learn to count, read, and write before they can understand the necessity and object of such processes, and years before they have any practical use for them? Is not building bridges the only way of learning how to build bridges, and is not dealing with people the only way of learning how to influence people? Why should a man who knows how to do things himself waste his time telling other people how to do them, especially as it is futile to tell another person how to do things? How much influence would Napoleon have wielded if he had been a professor of military tactics instead of a practical strategist? Finally, would it not be better for the world if there were less teaching and more learning?"

(R. T. HOUSE.)

LESSON III

TEACHING

PREPARATION STEP.—I. Many aims have been posited in education. Perhaps the most satisfactory one as a guide and test of the daily work in the schoolroom is that of character.

II. Try to realize anew the conception of your stream of thought as in some way a unit which has two aspects, now the outer, and again the inner, the two the same in kind. Think of the ever shifting present of consciousness as the rearrangement of secondary sensuous elements in time, space, and higher relations into ever more adequate generalizations and abstractions.

III. I wish you to learn a certain fact that can be made out of the following secondary material:

How many times a day do you wash your hands? You answer, "I wash them many times." What do you use in washing them? "I use water and soap, hand-sapolio sometimes."

Once at the seashore I saw a lady dust her silk ruffles with handfuls of the clean dry sand on which she was sitting.

Imagine that some one asks you to examine a dainty book, delicately colored. Your first thought is perhaps, "I must not soil it." You thereby show that you care for the quality of the book, have deference, respect to its beauty.

We have come to show respect in many cases in a figurative way, by symbols alone: One raises his hat to an acquaintance, bows to those he knows, rises to greet an older person, waits to allow him to pass first, kneels in prayer. What other symbolism do you use constantly?

Think how you would feel without any work—suppose you never had done anything toward a purpose. We have a proverb which says, "Satan always finds some work for idle hands to do," that is, our work keeps us out of mischief. The report of a certain prison in Pennsylvania states that eighty-three and one-half per cent of its inmates have no trades, were idlers.

But the good results of work are not merely negative, they are indeed positive in usefulness, virtue, and happiness.

Imagine as you look out that instead of trolley cars, buildings, and trees you saw a rolling waste of sand and sparse vegetation stretching away to the horizon in every direction, with not a drop of water for miles and miles, hours and hours. There is never any rain, the sun shines all the long day with an intense heat, and it is always summer. Imagine it vividly, as though you were actually walking along in the desert.

Point in the direction of Arabia. If you really went in the direction you are pointing, you would come to a star, would you not? "Come down to the earth" and remember that you must consider the shape of the earth, its curvature, in pointing to Arabia.

Picture, also, instead of the smartly-dressed Americans whom you see in the street, such a group of swarthy Arabs winding their way across the desert that you have made,—such a group as you have seen in Schreyer's pictures, perhaps. Imagine them as of middle stature and powerful make, dressed in loosely draped white or colored garments, with their heads protected from the sun by large turbans.

"The Arabs express in their features dignity and pride. They are naturally active, intelligent, and courteous, with a character marked by temperance, bravery, and hospitality, along with a strong propensity for poetry."

These people of the desert are, according to their lights, devout, good people. As to religion, they are worshipers of God whose prophet they believe to be Mohammed. A Mohammedan, you remember, has fixed hours for prayer, and, no matter where he is, at those times he turns his face toward the Holy City and prays.

The other day just at dusk, as I was walking along the almost deserted street, I suddenly became conscious that there was some one coming on the pavement just back of me. I glanced around and what was my amazement to see a camel! Then I remembered that *Ben Hur* was in town and decided that the camel and his attendant must be bound for the theatre a little way farther on. But for the moment it was inexpressibly strange to see a camel stalking along the city street—it quite transported me to another and very different scene—the long line of a caravan crawling over the desert.

Now the fact that I wanted to teach you is this one:

"The Arabs far from water wash their hands in the sands of the desert before prayer. So the dust of labor purifies us." (Auerbach.)

PRESENTATION STEP.—I. In learning this fact, you have brought together several groups of secondary material that had not been together before. In considering what teaching is, the standpoint is changed. How did you come to make these rearrangements? You made them because something or someone stimulated them:

Teaching is the process of stimulating rearrangements of secondary material in some one's mind.

II. If we learn from all our experience, haphazard and chance as well as directed, then every moment we must be taught. In school teaching, however, there is a definite aim:

School teaching is a process of stimulating in a pupil's mind the rearrangement of secondary material into systematized, scientific knowledge available for guidance and effective in enriching and energizing character.

APPLICATION STEP.—I. Of late "methods" of teaching have come somewhat into disrepute. This is as it should be in so far as they were formal or "cut and dried." A recent critic is indeed quite right to inveigh against labored, artificial "method" as suggesting the work of "the mediaeval barber's apprentice, who could set up for himself only when he could whip two ounces of soap into barrels of lather."

In so far, however, as the mind acts in certain definite ways, should not these ways be observed and taken as guides in this most important of all occupations, teaching? The fact, moreover, that "method" has been abused, that it has subordinated content and substance to form and made learning about as empty as it was when the teacher merely heard pupils recite text-books is no reason for inveighing against all method.

II. It is urged, also, that teachers do not know psychology, therefore it cannot be of use to them. But the fact that one does not know psychology is no reason why one should not study it. Psychology is not a more difficult subject to learn than many others if one is only willing to work patiently at it in the detailed way, for example, that one works at mathematics or the study of birds.

III. Though there are certain qualities in every good teacher that were born with him, much may still be done toward "making" him.

It is an advantage indeed to be well born as to health, emotional capacity, and will potential, yet most young people of average endowment in these respects can be made

into fairly intelligent and enthusiastic teachers. Knowledge of subject matter alone, however, will not do it, nor, of course, will knowledge of psychology alone.

You may have known, say, an excellent and enthusiastic teacher of science who had attained his high success without professional training. Yet was his enthusiasm for the process of teaching, for the science he was imparting, or for young people? The chances are that it was not for the first. If in addition then to the mastery of his science he could have had a mastery of the "reasons why" in teaching, might not his success have been higher still?

IV. You have thought about the difference in response by different people to the given stimulus. How individual a matter must learning in schools then be! Most teaching is addressed to the "average" pupil. The really defective type has little chance in ordinary schools and is usually provided for in a special school; the slow working type is perhaps best helped by a plan like that originated at Batavia, thus those who are clever above the average are doubtless the ones who suffer most from teaching in general.

V. No doubt classes are too large, particularly in primary and intermediate grades, in most city schools. Yet in spite of the fact of the difference in response to the same stimulus, I have seen really close individual work done throughout primary and intermediate grades, no one of which numbered less than thirty pupils, such work made possible by the choice of a rich content of myth and history with all their suggestions for other content and form subjects suited to the children's ages. Teachers here with a "keen scent for pairts in laddies" had abundant chance to discover individual aptitudes, and the pupils did not come out of those grades "all just alike."

VI. Can any lesson, any subject be taught at any time? Since the contents of a pupil's mind determine finally what

he can learn and since this material differs with each year of life as instincts and race tendencies appear and ripen, not all subjects or lessons are of equal interest or can be learned at all times.

VII. Since all there is to character in young children is instincts, education ought to be the process of making instinctive reactions into conscious ones and of correlating spontaneous acts into the reasoned ones of later character.

A suggestion as to how the school programme can accomplish this result (a suggestion happily followed by an increasing number of schools in this country), comes from the study of the contents of children's minds and characteristic modes of thought and action, a study which shows that the instincts ripening at different periods in a child's life cause him to feel an essential sympathy with the life and conditions of the corresponding race period. In a sense, the child remembers his racial past in the order in which it was lived. How better, then, can complete advantage be taken of the child's native impulses than by guiding him to live with vigor and truth freely through the best in successive periods of race development? For "In order that the heroic impulses of boyhood may neither disappear without serving a purpose nor degenerate, but rather lead on to the period of reason, they need an ideal presentation of such men as achieve what the boy would like to achieve, and who at the same time reveal the more suitably the transition to a higher order."

LESSON IV

THE LESSON UNIT

PREPARATION STEP.—I. Through custom and convenience our schools are fixed in the habit of devoting from thirty to sixty minutes of the day during each term or year to

each of the several subjects taught. The lesson is usually made up of one fact or a number that are related so as to form one whole.

II. One might ask in connection with the teaching of the fact about the Arabs, why not just tell it? What is to be gained by "lashing up so much lather?" Couldn't one learn, remember, and use the fact just as well without all that preparation? The answer of psychology to all three is, No.

If teaching is the process of stimulating the rearrangement of secondary material, then there is a distinct gain, and several gains, in calling up the secondary material before it is brought into new relations. Some of these gains are:

a) It takes time to learn, that is, to recall all the secondary material that one may have potentially at command. A preparation step gives time.

b) The Preparation Step brings a larger amount of secondary material to mind than could return if the new thought were given or read without preparation.

c) The Preparation Step, since it stimulates a greater amount of secondary material than would be in mind without it, makes possible a clearer understanding of the new fact. We "understand with all we know."

d) Since the Preparation Step brings up a large amount of secondary material to make into the new fact, it, the fact, will thus be in a larger number of trains of association and therefore more readily available. This means that the memory for it will be better.

e) The Preparation Step gives the teacher a chance to stimulate interesting and rich material, to take advantage of instincts and dynamic factors that make learning pleasurable. And only as learning is spontaneous is it educative.

f) We are said to be only relatively awake any of the time, so that it is of advantage to be able to start a recitation with material that will wake pupils up to a lively interest. They have perhaps just come from play or from another recitation, and they cannot spring at once into the thought of this one without help.

g) The Presentation Step, moreover, in its logical arrangement may begin in a relatively uninteresting place.

III. It is hard, perhaps, to realize from just one illustration that one does learn a fact more intelligently because of the preparation, the consideration of the secondary matter to be made into it—and yet when one considers the whole school life, the gain day by day of having a real content, what is intrinsically interesting stimulated into right relations, something of the value of preparation in the long run is seen.

PRESENTATION STEP.—Psychology suggests the division of each day's lesson, the lesson whole, or Lesson Unit into 1) the Preparation Step, the purpose of which is to call up secondary material and give the chance to meditate upon it, and 2) the Presentation Step, where the secondary material is brought into new relations. (A third step of the lesson-unit, the Application Step, will be considered in the chapter on Thought.)

APPLICATION STEP.—I. If you chance to be a teacher, analyze every day's lessons into a lesson-unit. Accustom yourself to make this analysis till you do so simply and naturally, almost instinctively, the moment you think of material to be taught. Try to arrange the material of narrations, letters, anecdotes, lectures after the same plan.

II. If it has been your custom merely to hear pupils recite what they have committed of the assignment of the

previous day, "Learn five pages more of your text-book," if this plan has been your custom, then try one somewhat like the following:

Notice what "the next five pages of the text-book" contain; give the preparation step for that material before assigning the lesson, and let the work at home on the "five pages" be a part of the Presentation Step. The repetition and added generalizations in class the next day can complete the Presentation Step. The Application Step may follow, partly in class and partly as assigned work to be done at home the next night.

III. It is hoped that the following suggestions on the two steps considered will be found helpful:

A. On the Preparation Step:

1. The preparation step (I hesitate to write it with capitals—it seems to make so formal a thing of it) is designed not as an introduction, a preface, a foreword to lead up to the new idea,—its aim is rather a very different one, that is, to call up all the secondary material that is to be made into the new idea.

2. State the aim of the lesson to the class. (This statement must not tell too much [the whole lesson], nor yet too little.)

3. Consider the beginning place. (Call up first the most interesting, rich, and striking concrete, even homely, secondary material.)

4. Make directions definite and concrete.

5. Do not confuse Presentation (new) material with Preparation (old, or secondary) material.

6. Prepare, in general, for all of the Presentation Step in the Preparation Step. (That is, call up all the secondary material needed to make the new ideas.)

7. All of the material in the Preparation Step is in general "old," or secondary. Sometimes, however, new material that does not belong to the Presentation Step, yet is necessary to an understanding of it, must be given here.

8. Do not call up more material in the Preparation Step than you need to use in the Presentation, and do not call up irrelevant material.

9. The form of the Presentation Step may be free question and answer, an informal, spontaneous conversation to bring vividly to mind the secondary material needed and to stimulate the imagination. The order of procedure should be psychological rather than logical. (Often the teacher may do most of the talking, for it does not follow that because pupils are not talking, they are not thinking to the best possible advantage.)

10. Often the best material for preparation is concrete material recalled from experience at home, at play, in every-day life wholly outside of school.

11. The material brought to mind in the Preparation Step should be as near to instinctive interests as possible.

12. It is often a help to pupils to have the teacher sum up at the close in outline the secondary material involved.

B. On the Presentation Step:

1. Arrange the new material in a short series of clear, numbered steps. (The teacher must have determined with perfect definiteness upon the material for the Presentation Step before either the Preparation or the Application Step can be planned.)

2. Consider [a] the completeness, [b] the unity, [c] the proportion, and [d] the progressive order of the Presentation Step.

3. Fix the material by a sufficient number of repetitions. (The purpose of the Application Step is sometimes mis-

taken to be repetition. All of the mere repetition of the new material may well come in the Presentation Step.)

4. All of the matter of the Presentation Step is, in general, new.

IV. The objection may be made that there would not be time in the school courses as they are now to teach by lesson-units.

In answer, it may seem more expeditious to teach children to say the words. In proportion, however, as the words are merely formal, involve only the tongue muscles, they are deadening and not educative. On the other hand, in proportion to the wealth of secondary material, past experience involved, learning is worth while. "*Festina lente* * * * should be printed in letters of gold over the doorposts of every school room, but whether or not teachers regard the motto, nature takes care that her best advice is attended to without the formality of a sign-board." No matter how much a teacher may flatter herself that, because the little tongues can recite the words glibly, the children have learned, nature sees to it that the poor children have to pay for the violation of her laws. It takes time to learn and even though our formal devices may seem to be short-cuts to knowledge, they are in reality nothing of the sort. Here as elsewhere "the longest way round is often the shortest way home."

V. There is danger here, as in the "method" inveighed against by critics, that a teacher will become mechanical and sacrifice all considerations to the form of the Lesson-Unit. The danger is lessened, however, in proportion as one keeps near to his psychology which gives the true reason for each step.

Some one has called psychology the teacher's "Blackstone." (Yet imagine a lawyer who goes back to his Blackstone as seldom as most teachers go to their psychology.)

It is more than that—it is his very life. Only as he keeps near it, is his enthusiasm glowing and his work intelligent. In proportion as he is ignorant of it, lacks a working idea of it, or fails to use it as a basis for all thought and procedure is his work the weaker.

To be sure, sheer human sympathy and tact may make a good teacher and may seem a substitute to a degree for explicit science, but human sympathy and tact are only true psychology empirically applied.

VI. A master of his subject, inspired and vitalized by a knowledge of the psychology of teaching, will come to teach with ease and to impart not a text-book, but large truths in a large way. His work, in time, will conceal the "bones," the "skeleton" of any studied form—it will become a matter, not of the letter, but of the spirit. One thus able and energized will guide pupils naturally and intelligently and will attain that high ideal of teaching, the stimulation of the learner to spontaneous self-activity, independent thought, and effective actualization of lofty ideals of character—teaching that will "extend the pupil's knowledge of things worth while, broaden and deepen his sympathies, and force him to feel and be and live his better self."

LESSON V

TRAINING THE "POWERS OF OBSERVATION"

PREPARATION STEP.—I. A musician is able to pick out a dissonant voice in a large group of singers. In an orchestra he can attend to the quality and pitch of each separate instrument. He is not likely to be equally observing of plant life, of conditions of health and disease, or of bridges.

The moment a bank clerk touches a counterfeit paper or coin he knows that it is spurious. The blind also are

very observing in the terms of touch, and their sense of smell is developed with wonderful acuteness.

An artist is sensitive to colors. Most women are more observing of colors than most men.

II. Imagine a group of persons on the day-boat passing West Point. They are, say, an engineer, a historian, a young girl, a West Pointer, a farmer: What will each one observe?

III. In what lines are you observing? In what, not?

IV. How often, when we have our attention called to a certain thing, we see repeated instances of it though we had never before noticed any! We have become observing of the matter.

PRESENTATION STEP.—I. In our "powers of observation" we are limited to what our past experience makes it possible for us to observe. To all else we are literally blind, deaf, callous. The musician has potentially an indefinitely complex and rich mental content of highly discriminated, emotionally colored, and scientifically classified knowledge of sounds. The artist has the same sort of knowledge of colors. And in the same way the peculiar training of the bank clerk has brought about a mental content that makes him observing in his own particular interests to a degree inconceivable to the ordinary man.

We observe with all we have observed.

II. It follows then that no one kind of knowledge makes a person observing in all directions.

The Indian, the type instance of acute sensitiveness to surroundings, though he is vastly learned in forest lore and wise in the interpretation of all of nature's signs, should he look with his marvelously trained eyes into a microscope could see little. His eyes are acute to see only what his thoughts enable him to see. He is observing only in a few limited directions.

Should a blind man receive his sight, though no longer blind he is still unable to see. He has not correlations of colors to fit the new circumstances and his complex correlations in touch, muscular sense, and smell are not transferable to sight.

No formal training of the "powers of observation" is possible.

APPLICATION STEP.—I. "He that would bring home the wealth of the Indies must carry out the wealth of the Indies."

"The only things that we commonly see are those which we preperceive." (W. James, "Psychology.")

"The difference" (in observation) "lies in the mind, not in the brute fact." (John Adams, "Herbartian Psychology.")

II. Sherlock Holmes criticizes a colleague: "He possesses two out of three qualities necessary for the ideal detective. He has the power of observation and that of deduction. He is only wanting in knowledge * * *" but that lack is fatal. The knowledge of Sherlock Holmes, on the other hand, is wide. He is observing in very many directions.

III. In what ways can training in school help children to observe? What suggestions can psychology give to teachers here?

"To cultivate observation, then, is not to train the eye, the ear, the hand to extreme sensitiveness, but rather to work up well-organized knowledge within the mind itself. If we desire minute observation in a definite direction, we must cultivate special knowledge to correspond. If we wish to encourage *general* observation, we can only succeed by cultivating wide interests." ("Herbartian Psychology Applied to Education," John Adams.)

CHAPTER VI

THOUGHT

LESSON I

THE SYLLOGISM

PREPARATION STEP.—I. What is the object you have in your hand?

It is a book, you say. (Notice the train of associations here and the correlations.)

II. How do you know that this object is a book?

Because it has printed leaves bound together.

The reason that you have given is much condensed. Expand it into all that you imply.

All books, you say, have printed leaves bound together; this object has printed leaves bound together, therefore, it is a book. (You have not said just what you meant, but for the moment, let it pass.)

III. Think in a similar way how you know other objects. And how do you know that this is to-day? That a certain color is blue?

In answer to the last you say, all blues are the result of a certain affection of my eye and optic nerve; this color is the result of such an affection, therefore it is blue.

PRESENTATION STEP.—I. The group of sentences that you gave in answer to the last question we shall call a syllogism.

II. How many sentences are there in this syllogism? There are three.

What is a sentence? It is the expression of a thought in words.

What are the parts of a sentence? They are the subject and the predicate.

What is the predicate of the last sentence in the syllogism? "(is) blue" is the predicate.

Notice that it, the term "blue" occurs once again as the subject of the first sentence. Write x over it in each place.

What is the predicate of the first sentence? It is "result of a certain affection."

How many times does this term occur in the syllogism? It occurs twice.

Write y over it in each case.

In all, how many different terms are there in the syllogism? There are three.

Write z over the remaining third term.

How many times does each occur?

Writing out the letters instead of the terms we have:

x y
z y
z x

All thought can in general be reduced to the form of the syllogism made up of three sentences and of three terms. This statement does not mean that we think consciously in syllogistic figures, but only that this movement is the natural one in apperception.

III. In logic (the science of the forms of thought) the sentences of the syllogism are called propositions.

In making the proposition "all snow is frozen water," I have a train of associations. The two terms of the proposition are associated or related not only by contiguity, but also by a correlation, that of identity. I assert identity between the two terms.

Looked at from the standpoint of thought, the mental assertion of the degree of relationship arrived at in the process of thought between two terms is a Judgment. The expression of a judgment in words is a Proposition.

IV. How is it possible to express the degree of relation between the two terms of the third proposition in each of the syllogisms in the Preparation Step?

I can say that this object is a book because I have compared both "this object" and "book" with the same idea, "has printed leaves bound together," and I have found the relation to be such in each case that I can say, this object is a book.

The mental assertion of the relation between two terms depending on their relation to a common third term is a Syllogism. The expression of the reasoning is also called a Syllogism.

The process of Thought is that of seeing relationships.

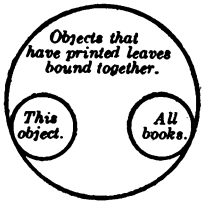
V. A little way back it was noticed that you had not said just what you meant. The syllogism given was:

1. All books have printed leaves bound together;
2. This object has printed leaves bound together,
3. Therefore, this object is a book.

Suppose we represent these three terms and their relations graphically: Let us picture "all books" as enclosed in a small circle, "somewhat as sheep might be in a pinfold, this circle containing all the 'books' and nothing else." Let a greater circle contain the class of "objects with printed leaves bound together." Now the first proposition says that "all books" belong to the class of "objects with printed leaves bound together." The picture of that proposition would then be:

No books could get outside the larger circle because all have printed leaves bound together.

The second proposition says, "This object has printed leaves bound together." Represent "this object" by a third circle and show its relation to "objects that have printed leaves bound together." Clearly it can go anywhere within the large circle. Suppose we put it in like this:



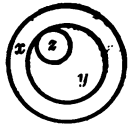
Does it follow that "this object" must come within the circle "all books?" Evidently not. It may or it may not. There is no reason why it should—all that the second proposition says is that "this object" must belong to "objects that have printed leaves." Then, you see, it does not follow that "this object" is a book,—we are not "driven to the conclusion" from the reasoning, therefore the syllogism is not a valid one.

VI. Is not what you really meant to say this syllogism?

1. All object made of printed leaves bound together are books;
2. This object is made of printed leaves bound together,
3. Therefore, this object is a book.

Now instead of z y we have z y Testing this syllogism by the circles we have,

1. All y's are x's
2. All z's are y's
3. Therefore, all z's are x's.



Since all z's are y's, they surely must be x's, for all y's are x's. This syllogism, then, is valid.

The second syllogism in the preparation step to be valid must then be:

1. The result in my mind of a certain affection of my eye and optic nerve is blue;
2. This color is the result of such an affection;
3. Therefore it is blue.

APPLICATION STEP.—I. I dwell upon this fallacy (or invalid course of reasoning) because it is so common. As I was writing this lesson I noticed the following advertisement of an insurance company:

"Savages do not insure their lives;
Morose and cranky people do not,—
Wife and children haters do not,—
Misers do not—
Persons whose sense of personal responsibility is feebly developed, do not—
People who are hanged, seldom or never leave life insurance.
Victims of swelled heads, do not—
The meanest man you know, safe to say, has no life insurance, and does not want it."

The implication is that if we do not insure, we shall be classed with these people. But we need not come under any of the classes according to the reasoning. If the advertisement read, "Those who do not insure their lives are savages," then it would follow, that one who did not insure his life was a savage.

The study of logic helps one to be critical of his language, to say what he means.

II. There is a theory that all thought is condensed syllogisms. It is difficult to determine this fact from

watching one's self, so difficult that many writers doubt whether we do think in this way.

III. From the observation of children it is evident that their reasoning is syllogistic, but it is also evident that their experience is so limited that they seem from the standpoint of the mental content of adult minds to "jump at conclusions." They judge from premises which to adults are insufficient. (Read "The Psychology of Reasoning," Th. Ribot, and other books on Thought.)

IV. Notice the predicate, "blue" of the third proposition: because it is a wider, or greater, or major term than the subject it is called the major term. The subject is the minor term. The term with which these two are compared is the medium, the common measure, the middle term. It, of course, does not occur in the third proposition.

This third proposition is a conclusion drawn from the comparison of the major and minor terms with the middle term. It is always spoken of as the conclusion. The proposition in which the major term occurs is the major premise, that in which the minor term occurs is the minor premise. In a strictly correct syllogism, the major premise stands before the minor, but in ordinary writing and speaking this rule is seldom observed. Correct reasoning, however, may always be reduced to the correct syllogistic form.

V. Expand where it is necessary and rearrange the following arguments, then show what is wrong with them:

His imbecility of character might have been inferred from his proneness to favorites; for all weak princes have this failing. (De Morgan.)

Every one desires virtue, because every one desires happiness.

VI. The syllogism by which we learn is apparently an invalid one. For example, I have (1) a group of grays and

drabs, (2) Thought words, grays and drabs, (3) Whistler's portrait of Carlyle. This train of associations expanded is:

This portrait is painted in grays and drabs;
But Whistler's Carlyle is painted in grays and drabs.
Therefore this portrait must be Whistler's Carlyle.

Then I confirm my conclusion point by point by valid syllogisms.

LESSON II

VALID SYLLOGISMS

PREPARATION STEP.—

m. 1. All horseback riders should keep to the bridle-path;
2. Those children are horseback riders;
3. Therefore, they should keep to the bridle-path.

n. 1. All stars are self-luminous;
2. No planets are self-luminous;
3. Therefore, no planets are stars.

o. 1. Mercury is not solid;
2. Mercury is a metal,
3. Therefore, some metals are not solid.

p. 1. No Americans are Europeans;
2. Some Europeans are progressive people;
3. Therefore, there are progressive people who are not Americans.

PRESENTATION STEP.—I. A glance shows you that in form not any two of these syllogisms are alike. For convenience in studying them, letter the terms with x, y, and z. Always mark the predicate of the conclusion, the major term, x, the minor term z. The term which is left, the

middle term, mark y. The lettering of these four syllogisms is:

1	2	3	4
yx	xy	yx	xy
zy	zy	yz	yz
zx	zx	zx	zx

These four are the only combinations of subject and predicate that can be made with the three terms in the syllogism when the conclusion is zx. They are called the four figures of the syllogism.

II. Notice that not all the propositions are like N. 1. Contrast N. 1 with O. 3, as to the distribution of their subjects:

N. 1. All stars are self-luminous.

O. 3. Some metals are not solid.

In N. 1, the proposition affirms the predicate to belong to the whole of the subject. That sort of proposition is called a universal proposition. In contrast to N. 2, it is affirmative. For convenience in speaking of it in logic it is represented by A. Examples of A are M. 1, 2, and 3; N. 1; O. 2.

N. 2, no planets are self-luminous. This proposition, also, is universal but negative. It is represented by E.

In contrast to the universal affirmative A, is the proposition, Some Europeans are progressive people, a particular affirmative, represented by I.

The particular negative proposition, Some progressive people are not Americans, is represented by O.

Propositions.
- Universal
  - Affirmative — A
  - Negative — E
- Particular
  - Affirmative — I
  - Negative — O

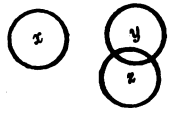
APPLICATION STEP.—I. Test each syllogism of the Preparation Step. The test for the last is:

x y
1. No Americans are Europeans;=E=xy

x z
2. Some Europeans are progressive people,=I=yz

z
3. Therefore, some progressive people are not Ameri-

x xy
cans.=O=zx, EIO in yz
zx



The second proposition says that some y's are z's, therefore the circle containing the y's overlaps that of the z's and the syllogism is valid.

II. How many different syllogisms of three propositions each is it possible to make out of the four propositions A, E, I, and O?

You can have AAA AEA
AAE then AIA and so on.
AAI AOA
AAO

If you work them all out, you will find that you can make in all sixty-four. Each one of these must be tested in each of the four figures, and this multiplication makes 256 syllogisms.

III. For the sake of familiarizing yourself with the propositions and the figures, test all 256 by the circles. You

will come out with the following valid syllogisms in each figure:

First.	Second.	Third.	Fourth.
A A A	E A E	A A I	A A I
E A E	A E E	I A I	A E E
A I I	E I O	A I I	I A I
E I O	A O O	E A O	E A O
(A A I)	(E A O)	O A O	E I O
(E A O)	(A E O)	E I O	(A E O)

IV. Expand into syllogistic form and test the validity of the following arguments:

No Athenians could have been Helots; for all Helots were slaves, and all Athenians were free men.

Ireland is idle and therefore starves; she starves, and therefore rebels.

V. Watch to see how much of your thought is in the form of judgments and syllogisms, filled out or condensed, incipient or complete.

LESSON III

CONCEPTION

PREPARATION STEP.—I. Each syllogism contains three terms. We are now ready to analyze the stream of thought from the standpoint of the changes that are ever taking place in the meaning of terms.

II. How extensive a traveler are you? How much do you enjoy travel? Think out the reasons for your answer.

Let us suppose you have spent four years in a high school. Now imagine that, instead of spending these years in school, you had spent them in travel: Compare the results in the two cases as to health, knowledge, general intelligence, integrity of mind, maturity, character, breadth and number of interests, resources, manners, memory,

power to observe and reason, capability to earn your own living and get on with people, to give pleasure to others.

III. Did you ever mistake, say, any verses for poetry which you afterward found were not poetry? Think of some definite time when you did. Your idea of poetry was changed by the experience.

Recall instances of mistaking one person for another; one object for another, as a box for a book, a grapefruit for an orange; one voice for another.

IV. Think of cases of uncertainty in identifying objects, as when one is doubtful whether a tree is of one kind or another; doubtful as to the use of a knife at table, as to a snatch of melody.

V. Recall how at certain definite times you have changed other ideas such as those of teaching, learning, success, beauty, right, wrong, duty, selfishness, hardness, pleasure.

Every change of this sort is surely expressed in language, that is, in condensed propositions and syllogisms.

VI. By analysis is meant the process of loosing, of separating what is complex into its elements. Synthesis, on the other hand, means the uniting of elements.

VII. What is a circle? a basket? a crab? distance? steel? a college settlement? a joke?

Have you defined each term adequately? Yet you have no trouble in using these terms. In how many different senses have you ever used the term joke, for example?

PRESENTATION STEP.—I. Our ideas are constantly changing as a result of our reading, our contact with people, and our thinking—in general, as a result of our experience. Think how different your idea of amusement is from what it was ten or twenty years ago. Define it in each case.

II. All thinking is thus a process of classification, of subsuming our concrete experience under one or another

class, or excluding it from a class, according to the laws of association. By each concrete experience some class, as poetry, is made broader or narrower in its extension, and more definite in its own peculiar meaning, or intension.

All the changes that take place in our ideas come under one of four kinds:

Take, for example, some of the changes that have taken place in my idea of desk. I formerly thought that any object upon which one might write was a desk. a) When I found that a desk must have a slanting top, many objects that before were included in the class desk (such as tables, shelves) had to be excluded. Thus my notion of desk is both narrowed and made more definite. Again, b) I had to drop the idea that the top was tilted to display the ornamentation, thus excluding a table with the top so turned. c) At another time I added the quality that desks may be used in churches, thereby including the lectern in the class desk. d) I later dropped from the class desk the quality that they must have legs, thereby including in the class the sloping shelf-like desk in a bank.

These changes are only types of those taking place every time I have an experience with a desk or think of one. They may be briefly classified as follows:

I narrowed the range or extension of my notion of desk
- a) By *synthesis,* when I added the characteristic, "Must have slanting top," thereby excluding certain tables for writing that I had before called desks;
- b) By *analysis,* when I dropped the characteristic "slanted to display the top," and excluded a mosaic table from the class desk.

I broadened the extension of my notion of desk
- a) By *synthesis,* when I added the quality "used for reading," thereby including in the class desk lecterns;
- b) By *analysis,* when I dropped the idea that desks must have legs, thereby including in the extension the desk in a bank.

As a result of my life-long experience I have broadened the extension of the class to include not only desks in schoolrooms, lecterns, and bank desks, but also portable writing-desks of all kinds and materials, office desks, cashiers' desks, and all the individual desks I have seen or heard of. In fact, with every experience of a desk, even every thought of one, I have broadened my class to include one more instance.

But, at the same time, every thought of desk has the effect of narrowing the extension of my notion, in that it removes something of the vagueness and superficiality of the intension (or group of qualities without which an object is not a desk) and thus rules out objects before included.

III. Accustom yourself to analyze the changes in many notions. Work out these analyses somewhat as follows:

I remember to have changed my idea of root:

I once narrowed the range, or extension of my idea of root
- a) By synthesis, when I added to the intension of the idea the quality that roots must be under-ground, thus excluding from the extension the runners of a strawberry;
- b) By analysis, when I dropped the quality that they may have nodes, thus excluding from the extension of roots the potato.

I broadened the extension of my idea of root
- a) At another time by synthesis, when I added the quality that roots may be in the air, thus including aerial roots;
- b) By analysis, when I dropped the quality that roots must be fibrous, thereby admitting fleshy roots like the carrot.

My idea of teaching has been changed many times. A few of the changes were:

I narrowed the range, or extension of my idea of teaching
- a) By synthesis, when I added the quality that teaching must stimulate the mind, thus shutting out of the class instances of formalism;
- b) By analysis, when I dropped from the intension of the class the quality that teaching may be the mere hearing of recitations, thereby excluding from the class instances of hearing pupils recite.

I broadened the extension of my idea of teaching
- a) By synthesis, when I added to the intension the quality that teaching may take place out of schools, to include cases of teaching by events;
- b) By analysis, when I dropped from the intension the idea that teaching must be done by a person, thereby including instances of teaching done by books.

IV. When we try to hunt down the "deskness" of the desk, that group of qualities without which the object would not be a desk, we find that the most abstract and general notion we can think is the group of words, "A support with a slanting top." This sort of statement of the intension (the group of qualities without which it would not be what it is) and extension (the range, or breadth) of an idea is a definition, "such a description of a thing as distinguishes it from everything else by briefly telling what it is," and a definition is perhaps as near as we can get to a "logical concept." A pure abstraction and generalization, however, a pure concept is unthinkable by a finite mind.

Some one has said that just as in medicine there are no diseases but only patients, so in thought there are no general notions but only perceptions that belong to classes.

V. Yet the activities of abstraction, generalization, and their opposites are real experiences, and we are abstracting and generalizing at every moment. It is these processes, in fact, that we have been studying.

I was generalizing when I broadened the range of my class desk to include lectern. I was hindering the process of generalization, or specializing when I added the quality, "slanting top," and, at the same time I was abstracting the "deskness" of desks from the accidental qualities of particular color, form, size, and use.

The opposite of the process of generalization is that of specialization. It consists in narrowing the extension of a general term. The opposite of the process of abstraction is that of making concrete.

When we are making more general the application of class names to individuals, we are generalizing; when we are dwelling upon the peculiar "thingness" of the thing

as separated from its accidental qualities, we are abstracting.

VI. When we are studying the stream of thought from the standpoint of its constant processes of abstraction, generalization, and their opposites our standpoint is that of Thought.

Since they are an unthinkable abstraction, no definition of "concepts" can be given.

APPLICATION STEP.—I. As a result of this process of thought the mind moves ever toward a realization of truth. Here, again, as in so many other places we come to a consciousness of its, the mind's limitation in that we can never know absolute truth, the abstract "concept,"—the truth we know is always individual and relative. There is an advance toward truth, however, with every thought. Some notion has become broader and narrower in its extension, more adequate in its intension.

II. I have used the term "logic concepts." Of course, as has been said, we never have concepts of any sort in our stream of thought. We do, however, constantly think some intension in the terms of sensations or words. But it is only when we look at this intension (which is always a perception, an individual notion) from the standpoint of abstraction, generalization, and their opposites that it becomes a matter of conception. These imperfect, often even mistaken, inadequate intensions that we think from moment to moment are what the books call "psychological concepts."

You will ask, perhaps, has not a word some one meaning that we think, the same for all occasions? It has not one, but many, many meanings. In fact, it never has just the same meaning for us even twice. Think, for example, in how many different senses you have used the term "man"

—this last use differs from every other, at least, in that it is for you the thousand and first use rather than the thousandth use, your thousand and first "psychological concept" of man.

Such a statement, on the other hand, as "The apple is the fruit of the apple-tree," one that represents the broadest generalization and the most abstract abstraction of a scientific type,—such a statement is the best guess of trained specialists of a wide and lifelong experience in the subject as to that impossible abstraction, "a logical concept."

Think how much progress has been made in the process of formulating these abstractions from the time of Plato with his "types laid up in heaven" down to the present with its many sciences—and particularly during the last fifty years.

III. A concept is not, then, some thing, a mental product, always the same that we can learn once for all, retain, recall, and use. The intension, that rapid review, usually in words, of qualities some of which are common to all of a class, is never twice the same. It is upon this fact that is based the most important application of the study of thought for teaching.

Education, whatever else it is, is also the process of making "psychological concepts" into more nearly "logical concepts," true wisdom available for daily living. And the process is a slow one and one constantly continuing, the work of a lifetime. A pupil can no more learn enough in ten years to equip him for all time than he can eat enough in ten years to last for the rest of his life.

That one never arrives should be no discouragement—that condition is one of life itself. The aim of school is to place one in the best possible position to continue learning in ever higher forms of thought to ever more complete maturity.

IV. As you accustom yourself to analyze the changes in the intension and extension of your ideas and become familiar with the constant modifications that take place in them, you will realize more and more fully how individual a matter the process of reaching truth by reasoning is. You cannot learn for another person any more than you can eat for the nourishment of that other's body. Changes are taking place at every moment in some idea, and it takes all this lifelong series of changes (the so-called "psychological concepts") to make into an adequate "logical concept," that is, the particular intension and extension represented by a definition that shall be the broadest working idea, available from the hundred and one standpoints where one needs to use it.

Sometimes a pupil will recite the words of a definition glibly, and even remember it till the examination. We flatter ourselves that we have taught him something. In proportion, however, as the words are merely mechanical, as "his tongue says it for him," is the "learning" useless, worthless, and even injurious. In proportion, on the other hand, as the learning involves his own psychological intensions of a lifetime is it educative.

V. "One would learn to know all the animals of the world more quickly by visiting Noah's Ark than by traversing the world, and picking up knowledge as we went." (Quoted by John Adams in "Herbartian Psychology Applied to Education.")

A visit to the ark apparently would save much time and pains to school children. Yet, compare for a moment the results of the two methods, "Ark teaching" and "traversing the world."

To be sure one could learn to name the animals and could study comparative anatomy in the ark. But what about the explanation of each animal himself? He is the

result of his environment and can be understood, comprehended only in that environment. Not all the animals can have their environment with them in the "ark," therefore they can be adequately learned only in their homes by the "journey method."

But it is not in zoology alone that schools practice "ark-teaching." Witness the museums; "lists of specific gravities;" "lists of words spelled the same but having different meanings;" that "Ark of Arks," the dictionary, and many other cases.

These devices indeed are supposed to save children the time and labor of "traversing the world and picking up knowledge as they go," but their results are really formal and worthless.

The defect of "ark teaching" is that it wrests facts from their right relations, the only place where they can be truly learned, and arranges them arbitrarily. It gives empty "logical concepts" where traversing the world makes the "psychological concepts" into "logical" ones at every step.

Of course one could hardly recommend seriously that children be literally taken to the ends of the earth to educate them, yet the truth that learning in proportion as it involves facts distorted from their true places is worthless, is indisputable. And we have to remember, moreover, that education takes time and that it is the process not of avoiding trouble but of "learning to take pains."

Yet the "Ark," the museum, and the dictionary have a place in education and an important one. It is not before experience, however, but after or at the end of it. (Read "Herbartian Psychology Applied to Education," John Adams.)

VI. Suppose all books, all records of classified knowledge were now destroyed: What would be the effect from this

time forward on the amount of each person's knowledge, say, your own? On your memories? Your power to reason? Your self-reliance? Your capability? Your happiness?

VII. What is a chair? a house? a hotel? a horse? a circle? What is the meaning of yes? boy? graft? love? laughter?

Answer these questions offhand and give them to your friends. Find out how near the real intension of these notions your "psychological intensions" come.

If you do not know the meaning of these terms, think of others whose meaning you do know. Doesn't it seem remarkable that we get along so well as we do, knowing the real significance of so few words that we use? Would it be of advantage to us to know "intensions" more adequately than we do? Of what advantage would it be?

The range and intension of our thoughts are of evident importance in life. "If," for example, "our concept of pleasure is limited to the feeling accompanying the satisfying of sensual appetites, we shall have trouble to comprehend pleasure as related to intellectual achievement, spiritual communion, or esthetic appreciation * * * we must have a broad experience." ("The Mind and Its Education," G. H. Betts.)

Notice the sources of "logical intensions:" For some we must go to the dictionary, for others to technical books in science, to text-books, or to statutes, decisions of courts, to sages who as a result of their peculiar experience, a lifetime of dwelling upon the qualities common to all of a class, can "speak with crushing authority" and who, with a mighty grasp of relations can "think God's thoughts after Him."

LESSON IV

INDUCTION AND DEDUCTION

PREPARATION STEP.—I. The stream of thought in its processes of abstraction, generalization, and their opposites may be studied from another standpoint, that of Induction and Deduction.

II. What changes have taken place in your idea of metal since you were a child? Think concretely how you would have described a metal then, and how the idea has changed from time to time since. Where would you go to find out what a metal is?

III. Think how the sciences of chemistry, physics, astronomy, biology, and sociology have grown up and been formulated. Was arithmetic formulated in the same way? or algebra? or geometry? Did the formation of the last three, like that of the others, depend on investigation, research, and discovery?

IV. I must urge you to keep up the practice of analyzing what you learn into its constituent secondary material, also, of analyzing your experience from the standpoint of teaching.

V. Say over the axioms of mathematics. Can you imagine any exception to the first one? Can you imagine any to the law of gravity?

Recent investigations in electrical inductance have shown that it is a law more fundamental than gravity even.

PRESENTATION STEP.—I. Any self-evident truth is an axiom. Since they cannot be analyzed into simple components, axioms are the simplest facts in nature. The next most simple facts are the laws and definitions, formulated in the course of human experience, that constitute the dif-

ferent sciences. But not all of these laws and definitions are of the same degree of simplicity, as constant investigation and research often analyze those before thought to be fundamental into something simpler. The theory has thus arisen that all the generalizations of science are in process of becoming axiomatic.

II. Relatively complex, on the other hand, are the concrete experiences. The different metals, for example, that are on my table, the brass of my lamp, the mercury in my thermometer, the steel of my knife, the gold of my watch and pen are groups of many qualities, accidental and variable. In the course of my experience I have analyzed these complex groups, stripped away their accidental qualities such as color, hardness, solidity, lustre, weight, sonorousness, and abstracted, synthesized from them the simple group of attributes common to all, until I have as the definition of metal: Any substance, usually elementary, electro-positive chemically, and forming with the elements of water a base is a metal.

III. The process by which through analysis of complex concrete instances, synthesis of their common elements, and incidental confirmations,—this process by which the mind reaches and verifies simple general truths involves both induction and deduction. In actual experience both methods seem to be involved in the same complex act.

Considered abstractly, however, when we are looking at the stream of thought from the side of reaching the simple general truths, our standpoint is that of Induction.

When, from the side of applying these generalizations to concrete instances, either in proof, confirmation, or in extending knowledge, our standpoint is that of Deduction.

APPLICATION STEP.—I. Considering them absolutely, notice some of the contrasts between these methods:

INDUCTION	DEDUCTION.
Proceeds from complex to simple, from particular to general, from concrete to abstract;	Proceeds from simple to complex, from general to particular, from abstract to concrete;
Is empirical, that is, limited to experience, scientific.	Is rational, that is, has to do with the reason rather than experience, metaphysical.
Its reasoning is based on experience, therefore, *a posteriori.*	Its reasoning is from previously assumed generalizations, *a priori.*

The two methods are identical in that both are processes of inference.

II. The empirical sciences have been built up by the formulation of general truths ascertained from observation of and experiment on particular facts. These generalizations serve as the bases for the classification of phenomena in logical order, thus making science.

But the logical order of scientific classification is not always the order most easily comprehended and followed by the mind in learning. For the attitude of the learner is ever that of the discoverer; to have an intelligent knowledge of the sciences, he, the learner, must literally make them for himself by the slow processes of induction and deduction. This statement does not mean that he must go through all the difficulties and discouragements of the discoverer of truth. But, though a teacher may remove impossibilities and arrange conditions, it is always the learner himself must do the learning.

III. Think of a text-book in botany made only of logically arranged generalizations. When an average house-bred city child used, a few years ago, to learn the general-

izations in this kind of book from cover to cover, he gained from the experience little more in intelligence than a parrot would have gained.

We are only looking, you see, at the old difficulty of "Ark teaching," but from a new standpoint. It is only by "traversing the world and picking up knowledge as he goes" or by a method analogous to this one, the slow method of induction and deduction, that a child can so master knowledge that it will become available and effective as ideals and motives.

IV. Analyze your concrete acts of the last hour from the standpoint of deduction: I, for example, just wound my watch (a concrete experience), because I knew, in general, that unwound watches stop; I cut out some clippings from a paper, as I knew they would be useful in some of my work; I read the evening paper, as I always like to know what has happened during the day.

Analyze as applications of different systems of philosophy the different schools of medicine, systems of law, political parties, systems of theology. Study the concrete applications in daily life of maxims and general rules of conduct.

V. The theory of induction and deduction is applied practically and concretely in the Lesson Unit. The method through the Preparation and the Presentation Step is, in general, inductive, through the Application Step, deductive.

It is commonly acknowledged that teaching through the first two steps is, in many subjects, fairly well ordered, but through the Application Step (except in some parts of mathematics) it must be conceded to be weak.

VI. "We have fallen from one extreme to the other: whereas formerly a hard and lifeless instruction laid the chief emphasis upon the memorizing of the text, it is the custom of our times largely to neglect the *application* of

that which is learned; consequently, the ever repeated complaint, that though our youth indeed know a great deal, they can *do* but little, that they possess indeed knowledge, but little capacity and readiness to act, and that upon leaving school, the knowledge largely disappears. Where drill and application are lacking, where a line of thought is developed, but in complete isolation from related thought, the capacity of applying this knowledge to its natural and appropriate field is soon lost, no matter how clear the original thought may have been." ("Apperception," Lange.)

"It is perhaps the most frightful gift which an evil genius makes to his age: knowledge without capacity to do." (Pestalozzi, "How Gertrude Teaches Her Children.")

VII. In the work on the Lesson-Unit some suggestions were given for the Preparation and Presentation Steps. Those steps are designed, the first to recall material empirically known, the second to make this material into one or more generalizations. The method in these steps is, in general, inductive; that in the Application Step is deductive.

Suppose the Preparation and Presentation Steps have been given to teach the generalizations:

1. Oxygen is a colorless, transparent, odorless, tasteless gas, somewhat heavier than air.

2. Chemically it supports combustion and respiration, promotes decay and rust.

The concrete applications of these general truths might be somewhat as follows:

APPLICATION STEP

Teacher—Why do we open a draft in a stove?

Pupil—To let in more air or O, so that the burning will be faster and the heat greater.

Teacher—What will happen if we cover the top of a lamp chimney?

Pupil—The light will go out.

Teacher—Why?

Pupil—Because, when the draft is stopped, the O is exhausted in the chimney.

Teacher—Why do you cover a burn with oil or flour?

Pupil—To keep out the O which seems to irritate the wound.

Teacher—Why do you have a cavity in your tooth filled with gold or amalgam?

Pupil—To prevent the O from continuing the decay.

Teacher—Explain why we can fruit and vegetables.

How is fine fruit preserved in the crates?

Pupil—It is wrapped in tissue paper to keep the air out and to prevent bruising.

Teacher—Why is the wood-work painted or varnished or oiled? Examine all materials in your home as to their need of protection or not from oxygen.

Suppose the atmosphere were all of O; what would be the condition of things in respect to combustion, rust, decay? And in respiration?

Suppose there were no O in the air: answer the above question.

Why should a room be ventilated?

Pupil—To supply fresh O.

Teacher—How do fish breathe? (To be answered by study at home.)

Teacher—How low down in the order of animal life does respiration begin? (Home-work.)

Teacher—What has breathing to do with the temperature of the blood in race history? (Home-work.)

Teacher—Name metals that do not rust?

Pupil—Gold and silver do not.

Teacher—And this is one reason why they are precious metals. Find out whether tin rusts. (Home-work.) Why do we have to paint tin roofs?

What is the color of iron rust?

Pupil—It is red.

Teacher—Yes, the rouge which the fashionable lady uses to paint her cheeks is chemically a sort of iron-rust.

What is the color of your cheeks when the blood is flowing freely and rapidly?

Pupil—They are red.

Teacher—And what metal is in the blood?

Pupil—Iron is in the blood.

Teacher—Yes, and the pink of healthy cheeks is chemically really the rust of iron in the blood. So the fashionable lady only helps nature a little!

You have seen that in the oxidation of wood, coal, and paper in burning, heat is set free, as it is also in the processes of respiration, rust, and decay. Thus as much heat is given off in the slow decay of a house during a hundred years as would be if the house burned to the ground in half as many minutes.

VIII. A few suggestions on planning the Application Step of lessons are:

1. The purpose of this step, if the work is to be deductive, is not mere repetition of the new facts (repetition is provided for in the Presentation Step), nor is it to find out what pupils know or have learned from the lesson. Its purpose is to cause pupils to apply in many well-known concrete instances the generalizations of the Presentation Step, to increase general intelligence and all-around capability, to give "The maximum of opportunity with the minimum of requirement," ("requirement" as ordinarily understood, a hated task.)

2. Much of the material of the Preparation Step may be explained by pupils in this step.

(The material of the Preparation Step is made up of well-known facts which have been observed, but are for the most part only empirically known. In the Application Step pupils should be able to explain it all scientifically.)

3. The Application Step as the culmination of the lesson should stimulate and inspire pupils to constant observation, investigation, research, study, thought, creation, action, and positive self-direction in connection with this particular lesson, without as well as within school, everywhere and always.

CHAPTER VII

ATTENTION

LESSON I

DEFINITION OF ATTENTION

PREPARATION STEP.—I. Pay attention to what passes in the street for ten minutes. At the end of that time write out as much as you can recall of all that passed through your mind while you were at the window.

II. Notice how the body adjusted itself in this act of attention. The head and trunk, no doubt, bent forward, all the muscles seemed to converge toward that to which you attended.

Make a study of such physiological adjustments whenever you are attending to anything. Notice, also, other physiological accompaniments of attention, such as scowling, straining the muscles, sighing, changes in breathing, and the circulation of the blood.

III. Watch for instances in yourself and others of imitation of action that you see; watch cases of the acting out of thoughts, as, when I thought of cutting with the shears, my lower jaw began to move; I know of a person who cut himself with a knife through very fear of cutting.

Watch cases of control of bodily movement and condition by persistent dwelling on an ideal.

IV. The etymology of the word *attend* shows it to be made up of two parts meaning *to stretch* and *to* or *toward.*

V. Notice how large a part of all trains of association is made up of judgments, propositions, or affirmations, either expressed or implied, complete or condensed.

VI. Are you realizing more and more fully that the fleeting present is a constant rearrangement of your past? That it is secondary material that makes each thought of both the outer and the inner order?

VII. Pay attention to your pencil for fifteen minutes: perhaps what you thought was somewhat like these series: "Pay attention to the pencil? Muscular sensations of scowling; Why, what shall I think? Visual image, The pencil is red; Visual image, It is pretty well used up; Visual image, It has a tin cap to hold the rubber; sound sensations, What a cracked bell! I hear that bell every time the car goes around the corner. Secondary visual image of the car, A yellow car; primary visual image of my table —I was to pay attention to my pencil; where was it made? They made pencils at Keswick; Secondary visual image of a stone bridge, a stream, and trees with the gables of Southey's home. How hard it rained that morning! Primary smell sensations of fresh ironing. Miss P. must have finished. It is getting late. I must pay attention to my pencil," and so on.

PRESENTATION STEP.—I. For how much of the time were you paying attention to the pencil?

I was attending to it while I was thinking of it.

Each element and group of elements as it comes along in the stream of thought is related to others—often this relation is definitely thought out in words, judgments, propositions. In the terms of propositions, when were you attending to the pencil?

I was attending to it when it, the pencil, formed one member of the propositions, (as when I thought, It is almost used up; I wonder where it was made).

You were attending to the pencil, then, for perhaps ten out of twenty judgments.

What were you doing the rest of the time?

I was attending to something else.

For how much of the time were you attending to something?

I must have been attending to something all the time.

II. We are indeed attending to some thought always, now, to a first member, again to subsequent members of trains of association; now to the outer order, again to the inner order. Attention is only another standpoint, then, from which to study the stream of thought.

When one is regarding the process of taking possession by the mind of an idea by being conscious of this idea in its relations, often by expressing consciously those relations in judgments incipient or completed, the standpoint is that of Attention.

APPLICATION STEP.—I. Contrast the standpoints of thought and attention:

In studying mental life under the aspect of thought we are dwelling upon generalization and abstraction through judgment and reasoning; under that of attention, we are dwelling upon the process of "stretching the thought toward" an idea. Both acts involve the process of judgment.

II. A question of perennial interest is, to how many thoughts can we attend at once? Though the question cannot perhaps be answered categorically, there are certain lines of observation suggested by it that are profitable to follow.

First. Have you ever tried to appreciate, to realize the quickness of thought in your own experience? How slowly the members of the body, the pen, and even the tongue move compared with thought.

The typewriting record is just now held by a woman who wrote 87 words a minute. Two women have just earned championships for speed on "arithmetical devices," one

as the adder and lister of 500 checks in seven minutes, 53 seconds, the other by adding on a simple adding machine a column of 34 lines in three and four figure items in 23 seconds. These people must have had to think quickly. Yet probably you often think as quickly as they did—only not in ways that can be tested like these.

The British Society of Musicians publishes this statement: In the present state of piano playing the eye of the pianist must be cultivated to see about 1500 signs in one minute, the fingers to make about 2,000 movements, the brain to receive and understand separately the 1,500 signs while it issues the 2,000 orders.

Second. Notice that the two questions, How many things can you do at a given time, and, How many thoughts can you think simultaneously, are not at all the same question.

Think how many acts are performed by the muscles alone, with only a start or direction by the quickly shifting mind. Watch in writing how many words your hand writes for you; in speaking, how many words your tongue says with only the most fleeting guidance from time to time by your consciousness.

Notice, moreover, how many different sets of muscles one can keep going under this flitting direction of consciousness. While the fingers are playing the piano, the tongue can be kept talking quite intelligently, the eyes watching the movements of a person near, the ears listening to the answers and questions of this person and several others—all these under the superintendence of the stream of thought, which passes with marvelous quickness from one to another function.

Third. Why do you close your eyes at the telephone? Why, choose a sheltered place to read? Is it not in the first case because what you see distracts you? That is, you

cannot attend both to what you see and to the conversation on the telephone, also, simultaneously. You attend to one at a time.

A student was in a room where she heard the intermittent whir of machinery for an hour. She heard, also, during this time, water dripping from a faucet. Upon leaving the room she was surprised to discover that the whir of the machinery was not intermittent but steady—it had seemed to cease when she had, at intervals, attended to the dripping of the water. That is, while she attended to the dripping she did not hear the whir.

To a person untrained in music a chord is one sound. Trained musicians, on the other hand, if they analyze the complex, think the different notes in quick succession.

All of these matters are of interest in connection with the question as to whether we attend to more than one thought at a given time, or whether the ultimate elements of thougnt are successive.

III. As to the physiological accompaniments or conditions of attention:

The nervous system consists in general of pairs of nerves, an out-carrying coupled with each in-carrying nerve, running from the surface and organs of the body to the brain and spinal cord. The stimulus of every in-carrying nerve, whether there is a discriminated result in mind or not, is followed by the response of a corresponding out-carrying nerve which brings about motion, actual or incipient, in the muscles, and these movements leave behind in the brain motor residua, we remember them. Thereafter, by the law of habit, movement is inherent in the image, "every image contains a tendency towards motion." Just as secondary visual or other images do not always possess hallucinatory vividness, so the motor elements may exist only in a nascent state. As you read or think these words, for example, are

not the muscles of your tongue and throat working rapidly, incipiently pronouncing the words?

In infancy and early childhood all the muscular movements incited by the efferent nerves take place. Mental life is mostly outer, primary,—trains of association are short, consequently there can be little thought or control of the attention. With added experience and years these random activities come, some of them to be inhibited, others to be the co-ordinated, controlled, skilled movements of maturity. Though in the process of training, much of the spontaneous, useless activity is suppressed, or at least only incipiently executed, there is still a result in mind from the stimulation of the afferent and efferent nerves. Thus thought has been described as "repressed action," the result in mind of incipient action, or, as Bain has it, "To think is to refrain from speaking or acting."

Any physical excitation produces a movement. Stimulation from any complex object produces incessantly repeated adaptation. Attention is not then a continuous, formal faculty *in abstracto.* Ribot describes it as a "psycho-physiological complex * * * intellectual monoideism," the result in mind of successive spontaneous or artificial adaptations of the individual.

"Motor manifestations with their subjective side are attention."

IV. The above facts are wide in their application, and of profound significance in the study of a human being as a self-adjusting mechanism. Make a study of and explain muscular movement (except automatic and reflex movements) by them.

Take first the cases of simple imitation,—such as, in speaking with a person who stuttered the image of the convulsion was so vivid in my mind that I with difficulty controlled my own tongue. A mother in watching her daughter re-

cite imitated the movements of lips, facial muscles, and gestures. These movements were "inherent in the images" in her mind, that is, fundamentally associated with them through the instinctive and lifelong relation of afferent and efferent nerves.

Study concrete instances to realize how much of our lives is imitation of others in matters of dress, mode of living, occupations, beliefs, ideals, amusements, and morals.

Second. The case of acting out a thought in mind: As I read the words, "deep breathing," I took a deep breath. A teacher gave in an examination the topic, "The Pleasures of Memory." She could tell when the pupils were writing on this topic by the expression of their faces.

Not long ago I met a Japanese law student who had come to this country to study medicine. He explained as the reason for the change in his course that he had suffered so greatly from all the diseases he studied about in the medical books that he had been obliged to give up that work.

V. This instinctive, naïve relation between thought and action is so strong that we have come to speak of it as control of the body by the mind.

In the matter of this influence, psychology has not yet seriously advocated control that involves organic changes, though it sees nothing unreasonable in mental control of all functional bodily changes. The application here is an important and far-reaching one for education.

VI. Habitual thoughts and moods in spite of us control the movements of the body, especially the finely adjusted and flexible muscles of the face, and these muscles are thus, in time, so modified that, to a discriminating observer, a face reveals something of mood, nature, and character.

VII. In general the effect of controlled attention on muscular adjustment is to give skill; on the senses, to sharpen them; and on the emotions, to strengthen them.

LESSON II

CONTROL OF THE ATTENTION

PREPARATION STEP.—I. In what are you most interested? If you are approaching twenty years of age, think about your interest in, say, fiction; your friends; dress; athletics; your work; your future plans; air castles.

II. Think out concretely and at your leisure how we should get on if we had no curiosity, no inquisitiveness as to the affairs of daily life, how and what to eat, to wear, what to do at home and abroad,—no desire to know what books say, what is to be seen in the world, what has been and is being done.

Suppose we had no fear of dangers that may arise in the street; of unsanitary conditions in the house or city; of poverty, wrong, dishonor, and of a thousand other things and conditions.

Suppose we were inattentive to hunger; to all the interests that arise from instincts of affection for other people.

If we had not paid attention to these matters, what would be our condition as individuals and as a race, and how long could we have existed?

III. Watch a child for an hour to discover how much control he has over his attention. Discover, also, the nature of the ideas to which he gives his spontaneous attention.

IV. A little child left a book out of doors. It rained, the book was ruined, and the child was punished. Later he left another book out of doors. This time when it threatened rain he remembered to take care of the book. What is his train of associations likely to have been?

As he grew older, in proportion to the effectiveness of his training in responsibility, he no longer left the book out till the rain fell, he remembered it, he came upon the

idea of responsibility in trains of association before the danger came.

V. Accustom yourself to watch your trains of association for the presence in some form of the idea of paying attention. Glance over the last few pages that you have been through in a book you are reading in order to find the places where you "came back," or came upon the thought of attending again. With the idea, "I must pay attention —I must work hard"—muscular strain begins. One "sits up," the forehead is scowled, the jaw is set, the hand or other muscles become rigid, and often it is the consciousness of this strain that is followed by the thought of control. One thinks, why am I scowling? O yes, I was paying attention to my work; then he starts in again to attend.

VI. Since we make the present out of the secondary material that we have, that secondary material must determine largely what the present can be. What we can attend to, then, the relations we can make, depends on what secondary material we have potentially.

VII. Do you know any one who is absent-minded? I know a person who, because she was thinking of something else, left her key in the door she had just unlocked.

PRESENTATION STEP.—In considering the subject of training the attention two matters are to be noticed:

1) The difference in ability to pay attention that mental content, its a) amount and b) nature, makes.

2) Control.

1. a. A musician is readily attentive to matters that have to do with his profession. How does the amount of his mental content on the subject of music and allied interests, the number of facts he knows in right relations here, compare with the number of facts he knows in other lines, say, house-keeping? He is likely to know much more about

music than he knows about the other matters. To a given book on music that he may be reading, he brings a great wealth of material with which to make relations and pay attention.

Suppose that you do not know Greek,—how long could you pay intelligent attention to a page of this language? Not long, as you do not bring to it any associations that would enable you to judge of the meaning of the page,—even though that page be a letter from your dearest friend. Suppose next that every other word only on the page were Greek—relatively how long could you attend to the page? Then suppose that every word is in English, what would be your condition as to attention? It would indeed be active.

"When confronting any scientific problem, the Newtonian mind * * * falls a prey to a perpetual irritation, which holds it in its power without cessation or rest." Ribot.

These examples illustrate the difference that the amount of material, the number of facts known makes in ability to pay attention.

b. As to the difference in ability to pay attention made by the nature of the mental content stimulated:

The activity of fundamental instincts makes a large amount of our experience from childhood up. In childhood the thoughts made out of these native tendencies alone can hold the attention. A child at a certain time, for example, feels a fundamental interest in his food and objects connected with it. Later he is interested, among other things, in the life of the periods of chivalry. At this time he will master and live out an enormous content from this period of race history with the most absorbed attention.

We speak of experiences of the outer order as "attracting" our attention. The term "attract" is misleading, because not every bodily stimulus brings about a discrim-

inated result in mind. "My experience" furthermore, "is what I agree to attend to * * * without selective interest, experience is an utter chaos * * *. Interest alone gives accent and emphasis, light and shade, background and foreground—intelligible perspective, in a word. It varies in every creature." (William James, "Principles of Psychology.")

The motives to attend to primary experiences have been arranged according to the attractiveness they have gained in the course of evolution in the following order: 1. Curiosity; 2, Fear; 3. Hunger; 4. Love; 5. Use.

To sum up, the musician is interested in his music, a child is interested in the life of the periods of chivalry. In each case the attention for the topic of interest is spontaneous and may last for a relatively long time. In the last case, that of the chivalrous child, the interest is evidently made out of instincts; in the first, this fact is not so patently yet none the less surely true. Though all interests trace back ultimately to instincts, the great amount of knowledge, the large system of facts known makes possible the interest of the musician and the scientist.

Given a) a wealth of mental content on a given subject, or b) a native interest in it, one can pay attention to it.

2. Control: Though our thoughts are ever "stretching toward" something, it is not always the right thing. The musician perhaps is attending to music when he should be attending to counting money. The process of training the attention must be one by which we gain control of it, so that we can attend to whatever we wish whenever we wish.

Whatever else control is, it is noticeable that it is a process of constantly returning to a consciousness of control, to the idea of attending in some form. Clearly unless one meets this idea he does not realize that he is "wool gathering."

One way then to help gain control of attention, or to make it voluntary, is to get the idea of paying attention into many trains of associations, to make it a dominant one, so that, no matter on what subject one may start out to think, he cannot get far afield before he comes upon the thought of having his wits about him, of being responsible, of not forgetting, of improving his time, of not procrastinating, or any of the many forms that this idea of control may take as a result of his training. "The faculty of voluntarily bringing back a wandering attention, over and over again, is the very root of judgment, character, and will. No one is *compos sui* if he have it not." (William James, "The Principles of Psychology.")

APPLICATION STEP.—I. What would be the effect on attention if we had no primary sensations, no outer experiences? We come nearest to such a condition at night, when we go to sleep. There is a case on record of a boy, a defective, who was deprived of all his senses except the sight of one eye. When his attendant wished to put him to sleep, he closed that eye and the boy went to sleep with the regularity of a machine. The effect of primary sensations is to keep us awake, attentive.

II. What we shall attend to in each case, and what the successive members of trains of associations shall be, seem to be ultimately a result of race experience. We attend, for example, to the painful sensations follwing contact with fire because that result has proved a useful one to which to attend. Inattention to it was followed by destruction. We never attend, on the other hand, to the dark that we might experience from the constant closing of the eyes in winking. Before noticing this fact, it seems to us that our eyes are always open. To attend to the dark intervals has never been useful to us.

III. The power of concentration is sometimes worshiped as the desirable end in training the attention. But is it really so desirable a thing for ordinary people? What is absent-mindedness but concentration, though on the wrong thing? Perhaps, however, if one had concentration enough he would not then be ordinary, and, while he was doing great things, he could have a keeper to attend to all the common concerns of life. At any rate, if one has control, he can concentrate his attention when he wishes and distribute it when that is necessary.

IV. So far as the process goes, there seems to be no difference between controlled, or voluntary attention, nonvoluntary, and involuntary attention. Voluntary attention, however, is always characterized by a sense of effort—perhaps the "mental reverberation of the physical strain," the muscular or bodily strain that is the physiological accompaniment of the thought of control.

V. What ways do you take to help control your attention when you sit down to work? Suppose you are writing a theme: Do you think it all out before you begin to write? Or do you sit down with pen and paper at a familiar table in your room? Do not the sight and touch of the familiar objects often serve to remind you, "I must get to work on my paper—I must pay attention—I must not waste my time." If you have ever tried to work in unfamiliar surroundings, you have surely found that sights and sounds with which the thoughts of control were not associated prove extraordinarily distracting.

Notice other helps that we give ourselves in paying attention: We turn as many senses as possible towards the idea; we strain the muscles to get what aid we can in that way; certain nervous little mannerisms seem to help us, such as moving the hands, playing with a pencil, button, or something of the sort.

VI. Why cannot a young child pay voluntary attention? Because, for one thing, he has not the idea of paying attention interrelated and interwoven with his mental content. He thinks of one thing after another without ever coming upon the idea of control.

VII. Whatever else it is, teaching is the process of stimulating the rearrangement of secondary material in a mind. The teaching is educative in proportion to the wealth of the material involved in the rearrangement. As to the bearing of attention in the matter, before the age of control, only in proportion to the presence in mind of a wealth of secondary material of instinctive interest can a child pay attention.

VIII. And as to the process of gaining control, one aim in education is to cause the idea of attending, of responsibility in some form to become dominant. Think of the directions one hears parents give: "Be careful!", "Shall you ever learn to be responsible!", "Do not forget! Attend to what you are doing!" and so on—all with the purpose of making dominant in trains of associations some thought of control.

One part, then, of the process of training the attention must be that of getting the thought of paying attention in some form into many trains of association.

One way to accomplish this result is to give formal, arbitrary directions like those I have just spoken of.

Another way is to supply a mental content of concrete ideals of people who were responsible, conscientious, self-directed in the affairs of life.

Suppose that, for example, a child's time in the grades were spent in living freely through successive periods of race history corresponding to his advancement from year to year with all the chances of such a program for the teaching of language, literature, art, the sciences, number,

physical training, and character. The great wealth of native, instinctive interests that he brings to make such material will cause it to hold his absorbed attention, and his life may be filled with an immense treasure, knowledge of the best from all human culture,—concrete and effective ideals of conduct and responsibility, the highest in all literature and history.

IX. When it comes to the question, How can psychology help me now to control my attention?—here as in training the memory to a sense of responsibility, control does not come by accident. Nor does the process of gaining control involve merely superficial mentality, for since attention and will are one, the process is as broad as life itself. It is not a matter of intermittent, spasmodic, sentimental effort, but it is a matter of habit ingrained in the physical make-up, the whole personality by unalterable loyalty and faithfulness, in season and out of season, whether the need or reward is in sight or not, everywhere and always,—unalterable loyalty and faithfulness to one's tasks. It is only such life-long training that results in the ability to do what one wants to do when he wants to do it, in self-control.

CHAPTER VIII

IMAGINATION

LESSON I

IMAGING AND IMAGINATION

PREPARATION STEP.—I. Name ten people you know. Think of the face of each as though the person were before you, that is, image it vividly. Test some of the images by drawing them.

Image the sounds of voices, peculiar enunciation, pronunciation, or quality. Image "bird-calls, yawps, hoots, barks, cackles," automobiles; the music of human voices, of instruments.

Image definite scenes of last summer, yesterday, ten years ago, your childhood; image buildings, the starry heavens at night. Do the stars shine in the daytime?

Hold your mouth open wide while you think the words, "I'm bound to blow bubbles."

What did you really think?

II. Imagine the sort of clothing you would have if you could have anything you wanted. Imagine the sort of journey you would take if you could go wherever you wished; Imagine, if you had your choice, the sort of home you would build and the people you would have in it; the sort of person you would like to be in appearance and character, the sort of person you will be ten years hence.

Please do not just smile, but take time to imagine and image in detail these conditions or others of your own choosing.

III. Recall the scenes and characters you imagined to make the last book you read—other books.

IV. Do you imagine the conditions of the Atomic Theory and the theory of perception more adequately than you did before you began working over your world in their terms?

V. Before in this lesson you recalled images, imaged them, under what circumstances did you image? Where did you use imagination?

Study the variety of sensuous elements in all your imagery. To what extent were the thoughts of your ideal journey visual, to what motor?

VI. Remember that the stream of thought at any moment is present, the action and interaction of sensations all the same in kind though varying in vividness, all secondary, sometimes of the outer and sometimes of the inner order. Remember that we do not carry about with us mental states from our past experience, but that we create anew as we need it and in accordance with the law of association secondary material that we recognize as answering the purpose of yesterday's outer or inner order.

PRESENTATION STEP.—I. In using the terms imaging and imagination I have assumed the ordinary understanding of them.

In imaging the faces, scenes, and sounds of the first question, you were trying to reproduce then as completely as possible—to have sensations in the same relations, as many as possible, and as nearly like the former experience. You no doubt imaged vividly also the scenes in your imaginary journey, the appearance of your ideal house and garments.

When we are thinking of the adequate, vivid production of sensations in time and space relations, we are looking at the stream of thought from the standpoint of imaging.

II. In imagination, when thinking, for example, of what kind of journey you would like, you varied literal repro-

duction. You built up from your secondary material structures that conformed to an ideal of, say, a trip around the world. Part by part you fitted together images, rejecting by the law of association what did not and choosing what did conform to your standard.

In imagination our standpoint is that of a synthesis of sensations that transcends experience, a combination constructed to conform to a given standard.

APPLICATION STEP.—I. Study the source of material that you use in imagining; study an act of imagination from the standpoint of trains of associations, of memory, of apperception, and of attention.

II. Analyze the process of your imagination in having purchased and had made your last new garment; in making the last journey you took on the cars; in writing your last letter. Notice how the secondary material that came to your mind was tested point by point by a standard, cast aside if it did not conform and, if it did, was built up into the ideal of what was to be done.

III. Go over some of your lesson-units and study each step to see whether you have stimulated imagination all that you might and whether you have made the images as vivid as you might.

IV. It is said of Puvis de Chavannes that, when he had a wall to decorate, he sat before the space and planned, imagined, and imaged his design until he saw it all vividly, then only did he begin to work on cartoons.

Mr. Will H. Low gives a delightful analysis of constructive imagination in his account of the decoration of the ballroom of the Waldorf-Astoria.

The fact that there were on the walls a number of lunettes and medallions first determined the size and shape of his designs. He then had to decide on subjects. The

purpose of the room, a stately salon for balls and music, fixed his choice on human figures rather than on landscape. Instead of representing the customary muses, Mr. Low lent a modern interest to his work by composing for each medallion an ideal female figure to stand for a country on whose peculiar musical instrument she is performing.

Of course there was no difficulty in the choice of such an instrument for Scotland—it could be no other than the bagpipes. Ireland, also, could be pictured only with the harp, and Spain with the castanets. When it came to Russia, however, the choice was not so easy—it finally fell upon a string of sleighbells. And the selection for our own country, which was really the most difficult of all, was happily settled at length by the representation of the figure of a young girl holding a scroll in her hands from which she is singing.

Mr. Low's whole sketch of his plan for studio accommodation, for the use of canvas instead of the perishable plaster of the wall, and other details affords an admirable and fascinating analysis of the processes of selection and construction in active artistic imagination.

V. Notice the use of imagination on the part of all writers in construction, style, and figures.

How much more secondary material, how many more trains of association do figures stimulate and rearrange for us than just plain literal statements could do. Cable somewhere tells about a house with "the shutters so tightly closed that it hurt your finger-nails to look at them." Paul Leicester Ford made one of his men say in answer to the question as to what he thought of the heroine's eyes, that they were fine—"rather dressy, however, for the daytime." Thought and expression, alas, do not always flow with equal readiness—how often in writing or speaking is one reminded that he seems to be "wading through glue"!

Compare figures such as these with literal language as to force, vividness, and power to call up images that enrich meaning.

VI. When we think of imagination as used only in construction in art, literature, and music, the view is entirely too narrow.

How far could you have gone in the course of to-day's activities without imagination? How could you have dressed, eaten your meals, spoken to people or conversed with them, read, gone to your work or office, done your tasks had you been confined to literal reproduction? What has imagination to do with your appreciation of nature, music, art, beauty anywhere? What with your relation to other people, your sympathy with their joy or sorrow, with unselfishness, thoughtfulness, ideals, and character?

VII. What are the disadvantages of being too literal? Do you know a Peter Bell?

The lack of imagination makes life dull, prosaic, commonplace, empty,—hampers one in every way. Because without imagination one has nothing to say, he cannot converse, —he is like Charles Lamb with his "dumb devil;" because he is not ingenious, he cannot get out of a difficulty; being a literalist he has no sense of humor—why was the Englishman always three jokes behind? Deprived of his heart's dearest, he has no resources.

LESSON II

CULTIVATING IMAGINATION

PREPARATION STEP.—I. A certain man with seven small brothers and sisters made their home a veritable fairyland for them. "The lower part of the garden," a sister writes, "was a wilderness at night where we would all go with my eldest brother (we did everything with him when he was

home), taking rugs and comfortables, and lie on the grass, telling stories or rather being told stories, picking out the different stars and constellations—watching their motion and listening to the crickets, the contrast between their lives ending with the frosts and the eternal stars never failing to charm and fascinate him. Every sound heard in an adjoining yard—every light was accounted for and explained in some way to fit in with the circumstances. Witches, ghosts, buga-boos, and caw-caws were as familiar to us as were any of the people we associated with. Ever since in all my reading I have come across places and persons familiar to me all my life from this naming of every spot and thing and this figurative way of accounting for the most ordinary occurrences from Don Quixote, Arabian Nights, Shakespere, Victor Hugo, the Old Testament,—all with an added interest because of this.

"We had an open stove where we sat most of the time in the winter. When coal was put on we sang to the fire to make it burn so the front could come off. We sang all kind of nonsense to tunes I have since found out are airs from the great operas," and so on—I have pages describing the charm and delight of this home.

"I am aware," continues the sister's account, "that to an outsider much of it must seem the variest nonsense, but to us living in that atmosphere from the time we were born, it has been a source of great pleasure * * * there never were children so happy and I learned more that way than I ever did in school * * *. Above all, don't misjudge my brother and think of him as simply a fanciful man. He is a smart, taciturn civil engineer, claiming no love for children but with an almost extreme compassion for the sufferings of a child or animal."

One does not often find a staid and practical adult with so fanciful an imagination.

II. Your observation will surely have convinced you that all our experience is in the terms of mental content. Whatever mind may be without its thoughts, we can never catch it by itself. Since our sensuous material has always a whenness and a whereness, in sleeping and waking we are always perceiving. Since we cannot even imagine an experience the elements of which we have not before known, we are always at the same time remembering. Since we are always reaching broader generalizations and higher forms of logical relations, we are always thinking and apperceiving. And since, to a critical observer, each moment's experience is at least slightly different from any preceding one, imagination is involved in each successive present. The degree, nature, and spontaneity of the imagination will thus have to do with the mental content of the individual at any given age and moment.

III. Mr. N., the civil engineer, has no doubt, a vivid and facile imagination in the construction of bridges and such things, but it was not his professional knowledge that enabled him to make the children's paradise. Nor was this paradise made out of nothing. It required mental content of a specific kind.

Suppose that by virtue of a person's imagination in that direction he is a gifted actor—these gifts would not secure his success as manager of a traction company.

Only as he has the content and spontaneity can one imagine in the terms of any given content.

Since there is then no such thing as The Imagination in general, it is not possible to cultivate it any more than it is to cultivate The Memory; therefore the subject of this lesson ought to be cultivating the Imaginations.

IV. The imagination of primitive peoples and children is regarded as their earnest and honest endeavor to explain their world and conditions. Because of their insufficient data

these explanations seem to us fanciful and grotesque. We are accustomed to say that children have more imagination than adults. Perhaps they have; certainly their imagination is different from that of adults. It is a familiar fact indeed that in childhood the predominant mode of thought is that of fanciful imagination.

The first appearance of imagination in race and individual seems to be in play. "It is often a well marked epoch when the young child first learns that it can imagine and state things that have no objective counterpart in its life, and there is often a weird intoxication when some absurd and monstrous statement is made, while the first sensations of a deliberate break with truth cause a real excitement which is often the birth pang of the imagination.

"Sometimes their (children's) fancy * * * develops into a kind of mythopeic faculty * * * all their life is imagination. Its control and not its elimination in a Gradgrind age of crass facts is what should be sought in the interests of the highest truthfulness and of the evolution of thought as something above reality * * *." (G. S. Hall, "Adolescence.")

PRÉSENTATION STEP.—I. When one tries to sift down to something tangible the different demands made on schools "to cultivate the children's imagination," one finds that they fall loosely into two classes:

1. The demand for a training that shall bring about greater creative ability, power to originate in the ordinary affairs of life. President Eliot once said: "There are two kinds of people in the world,—imitators and creators—advancement is made by creators. Get to be a creator as soon as possible."

Unless one loves his work there can be little spontaneity in creation. If schools, instead of trying to make all chil-

dren just alike, could but discover or cultivate special aptitudes, "detect a scholar in the egg," there would be a better chance for later originality, inventiveness, and advancement.

Genius has been defined as the preservation into mature years of the fecund mental spontaneity of childhood. How much have schools to answer for in that we have not more geniuses?

2. The demand for the preservation in later life of something of the poetic imagination of childhood, a matter of the aesthetic and emotional interests.

If it is true that a "poet has died young in the breast of the most stolid," surely something might have been done by education to cherish the life of this bard; to arouse a deeper and more lasting love of "beauty which is everywhere a sweetener of life;" to foster romance and idealism which, since "one's reach is beyond his grasp," ever elevate to a "heaven" that may be his daily life, and to that glowing spiritually which makes in later maturity the prophet and the seer who dream dreams and "are not disobedient to the heavenly vision." "Without a vision the people perish."

II. But these "imaginations" do not grow and thrive by accident and on nothing. They need food and cultivation. If schools instead of deadening the instinctive spontaneity of fanciful imagination in childhood should nourish and strengthen it on its native food, the stores of anthropomorphic myth and legend, all later life both the poetic and the practical side would gain in charm and power.

APPLICATION STEP.—I. What would be the value of imaging and imagining more vividly and adequately in matters of daily life, say, in clearness of thought and enun-

ciation when we speak; in deftness, skill, and speed in what we do with our hands; in definite planning for a busy day or lifetime; in reading books, in ingeniousness, inventiveness—(Do people say of you as they did of Sentimental Tommy, "He'll find a way?"), in time of danger such as fire, drowning, runaway, railway disaster; in kindness, thoughtfulness, and sympathy for those about us; in the positive realization of how good a thing life really is?

It is said that if a person wishing to learn to skate could and should think out, imagine, and image definitely and clearly all the muscular co-ordinations involved, he could skate at once without practice.

II. What difference does "acting it out" make in the vividness of imaging and imagination?

It makes a vast difference. When I asked you to think with your mouth rigidly open the words, "I'm bound to blow bubbles," thus hampered was not what you thought something like this combination, "I'ng 'oung 'oo 'ow 'ugh-'ugh?" That is, you thought what you would have to speak with your mouth open. Now see how much your imaging of the labials and linguals is helped by actually putting the lips and tongue in right position. Without whispering, move the lips and tongue as though speaking and think the words again. You can image all the sounds completely. This simple illustration gives us a hint of the gain in imaging from "acting it out."

To a child, acting it out makes all the difference in the world, and every advantage should be taken of the spontaneous impulses native to childhood so to act out everything possible in school and outside, number, nature study, art, as well as the life of primitive peoples. This acting out in its broad sense is the most important chance that comes for muscular co-ordination and consequent brain

correlation. It is the golden opportunity, too often wasted, for all early muscular and bodily training with its corresponding brain development and growth of power.

Play is regarded as the motor habits and spirit of the past of the race persisting in the present. "This is why the heart of youth goes out into play as into nothing else, as if in it man remembered a lost paradise. This is why, unlike gymnastics, play has as much soul as body * * * play is the ideal type of exercise for the young, most favorable for growth, and most self-regulating in both kind and amount * * *. Play at its best is only a school of ethics. It gives not only strength but courage and confidence, tends to simplify life and habits, gives energy, decision, and promptness to the will * * * brings out individuality.

"The field of play is as wide as life and its varieties far outnumber those of industries and occupations in the census.

"The present thought, if true, is only action repressed to be ripened to more practical form * * * muscles come before mind, will before intelligence, and sound ideas rest on a motor basis * * *. The roots of play lie close to those of creative imagination and idealism." (G. S. Hall, "Adolescence.")

III. "Every healthy boy and girl needs an immense deal of play not only with the legs and hands, but with the imagination. Childhood ought to be surrounded by a broad zone of mystery and wonder. The unimaginative childhood makes the drudge in middle life and the cynical man in age. The childhood that is rich in imagination brings the artistic quality into work and distils so much sentiment into the soul that in all the relations of life there is underneath its cares, responsibilities and preoccupations a touch of romance, and life without a romance

is not only prose, but prose that kills. The world needs more dreamers. There ought to be more lovers and poets among men; there cannot be too many of them. But lovers and poets are not made in middle life; they are made in childhood, and they are made by appeal to the imagination." *The Outlook.*

IV. There are still people who look askance with a severe Puritan fear at the make believe life of a natural child. Myth and studies from primitive life are frowned down, and a child is taught only the truly true from history, which he, if unspoiled, promptly turns into "make believe," because "it is his nature to."

Many parents and teachers, however, are coming to see that children's spontaneous fanciful tendencies are inestimably valuable for education and to realize the necessity, not only of not suppressing them, but also of taking advantage of them, and even of cherishing, feeding, and cultivating them to the greatest possible extent on the richest possible content, a whole wealth of which exists in the literature of power.

"Out of the ignorance of the nature of the child, and from the spirit of dogmatism and bigotry, there has come the falsehood that says the myth does not contain the whole truth, and therefore must be rejected. Who knows the whole truth? Shall the child be robbed of that which delights its soul and lays the foundation of true religious life? No greater mistake can be made in regard to the spontaneous activities of the child, for the myth is the first fire-mist of character, it contains golden symbols that point upward to God and to heaven. The myth is the foundation of faith in the future life, the foundation of all spiritual growth. The fairies and trolls change, as the soul changes, to real folk and real life * * *. No rough voice and no ignorant soul should ever tell the little

child that Santa Claus does not exist, for Santa Claus is the foreshadowing of the All-Giver, All-Lover, the one who gives because he loves. (Francis W. Parker, "Talks on Pedagogics.")

IS THERE A SANTA CLAUS?

Reprinted on this Christmas morning at the request of many friends of THE SUN, *of Santa Claus, of the little Virginias of yesterday and to-day, and of the author of the essay, the late F. P. Church.*

We take pleasure in answering at once and thus prominently the communication below, expressing at the same time our great gratification that its faithful author is numbered among the friends of THE SUN:

DEAR EDITOR: I am eight years old.
Some of my little friends say there is no Santa Claus.
Papa says, "If you see it in THE SUN it's so."
Please tell me the truth; is there a Santa Claus?

VIRGINIA O'HANLON.

115 West Ninety-fifth Street.

Virginia, your little friends are wrong. They have been affected by the scepticism of a sceptical age. They do not believe except they see. They think that nothing can be which is not comprehensible by their little minds. All minds, Virginia, whether they be men's or children's, are little. In this great universe of ours man is a mere insect, an ant, in his intellect, as compared with the boundless world about him, as measured by the intelligence capable of grasping the whole of truth and knowledge.

Yes, Virginia, there is a Santa Claus. He exists as certainly as love and generosity and devotion exist, and you know that they abound and give to your life its highest beauty and joy. Alas! how dreary would be the world if there were no Santa Claus! It would be as dreary as if there were no Virginias. There would be no childlike faith then, no poetry, no romance to make tolerable this existence. We should have no enjoyment, except in sense

and sight. The eternal light with which childhood fills the world would be extinguished.

Not believe in Santa Claus? You might as well not believe in fairies! You might get your papa to hire men to watch in all the chimneys on Christmas Eve to catch Santa Claus, but even if they did not see Santa Claus coming down, what would that prove? Nobody sees Santa Claus, but that is no sign that there is no Santa Claus. The most real things in the world are those that neither children nor men can see. Did you ever see fairies dancing on the lawn? Of course not, but that's no proof that they are not there. Nobody can conceive or imagine all the wonders there are unseen and unseeable in the world.

You may tear apart the baby's rattle and see what makes the noise inside, but there is a veil covering the unseen world which not the strongest man, nor even the united strength of all the strongest men that ever lived, could tear apart. Only faith, fancy, poetry, love, romance, can push aside that curtain and view and picture the supernal beauty and glory beyond. Is it all real? Ah, Virginia, in all this world there is nothing else real and abiding.

No Santa Claus! Thank God! he lives, and he lives forever. A thousand years from now, Virginia, nay, ten times ten thousand years from now, he will continue to make glad the heart of childhood.—*Leader in the New York Sun, December 25, 1906.*

V. Consider your school text-books as stimuli to the imagination. Let us start with geography. The pictures and maps are usually a great help to the text, and the text is often written so as to enable the children to travel quite extensively in imagination. Yet a student told me not long ago that she was quite well grown before she realized that the blue spot on the map of her geography was meant for the Lake George where she spent her summers.

And in history: Compare the ordinary text-book with the historical novel as a stimulus to the imagination. Which of the two books uses to a greater extent the material of your own life to make the people and events of other times? Which people are more real, which do you remember more vividly? Another student told me that she was quite

"through" American History before she realized that the present time was not the first period of peace ever enjoyed by our country. As she had learned her history, it was a succession of wars and battles.

In literature the edited classic overloaded with notes is charged with giving undue attention to details, technicalities, and leaving nothing to a child's imagination or invention. Too often the eternal spirit of the substance of literature is missed in undue attention to philological, chronological, and historical dry bones. Carl Holliday in an appeal for the cultivation of the imagination in the study of literature urges, "Let us, in the name of all that is beautiful, sincere, and ennobling study literature for its spirit, for its eloquence of beauty, for the reason that here is expressed well the thing which every man has felt but could not tell * * * (Literature) appeals to the soul, it preserves the imagination * * *.

Richard Le Gallienne once asked a famous scientist for a definition of life. " 'Nothing easier,' he gaily replied. 'Life is a product of solar energy, falling upon the carbon compounds, on the outer crust of a particular planet of a particular corner of the solar system.'

" 'And that,' I said, 'really satisfies you as a definition of life—of all the wistful wonder of the world.' And as I spoke I thought of Moses with mystically shining face upon the Mount of the Law, of Ezekiel rapt in his divine fancies, of Socrates drinking his cup of hemlock, of Christ's agony in the garden, the golden faces of the great of the world passed as in a dream before me,—soldiers, saints, poets, and lovers * * *.

"The carbon compounds!

"I took down Romeo and Juliet, listened to its passionate spherical music, and the carbon compounds have never troubled me again.

"Love laughs at the carbon compounds, and a great book, a noble act, a beautiful face make nonsense of such cheap formulae for the mystery of human life."

"Knowing, then, the value of the imagination in the youth of man,—its power to arouse sympathy; its ability to bring happiness out of adversity, its force as a creator of action, above all, its absolute necessity in the erection of ideals, can we believe an education complete that has not included a training of this mighty spiritual faculty? Surely, it would seen that in the unremitting effort toward the uplifting of man there must soon come a new direction of energy—a zealous movement from the standpoint of his imagination."

CHAPTER IX

WILL

LESSON I

WILL ACTION

PREPARATION STEP.—I. How much of your day are you quiet, not doing, or planning to do anything?

II. Everything that is consciously done, every thought and impulse, all feelings, emotions, desires, as well as muscular action,—all are food for observation in the study of will action.

III. Think over some of the things you have done in the last hour. I, for example, answered the telephone; showed a maid about some work; sat still and thought out something that I wanted to say; sorted and classified some material for my work.

Recall definite acts of yesterday, last week, last year, and so on.

IV. Notice the activities that your muscles carry on for you without conscious direction, such as beating the heart, breathing, winking. How much conscious direction do your muscles require when you walk across the room? Walk about and see. When you walk down town there is some slight direction of the body by the mind at the street corners. Aside from this guidance, do not your feet walk for you quite alone most of the time?

How much conscious direction is required in talking, writing, singing, dressing, eating, conversing, reading, understanding, driving an automobile?

V. How much of your day is made up of acts and planning for them?

VI. In the analysis of will we shall follow what is known as the biologic theory, though without in the least involving its metaphysical implications. The theory is psychologically sound, and no other theory is so simple and clear and has so great a value in stimulating observation.

VII. For the moment, then, study the stream of thought as though it were made up of the action and interaction of sensations, sometimes inner, sometimes outer with an accompaniment of feeling pleasurable or painful, all the resultant at each moment of the entire bodily condition, and accept as existing the impulse that keeps up a constant and continuous purposive activity without consideration of its origin. All thought is repressed action, and "In all forms of attention * * * we find selective activity going on. Selection always implies a purposive, forward-looking type of action, and this is precisely what attention is in all its forms. It stands for the fact that the organism is teleological in its very constitution. That is, to say, the organism contains within itself certain *ends* to be attained in the course of development by adjustive activities. In part these ends exist imbedded in the physiological mechanisms, where they come to light as reflex, automatic, and instinctive acts, sometimes accompanied by consciousness." (J. R. Angell, "Psychology.")

PRESENTATION STEP.—I. Perhaps the simplest analysis of will action in modern psychology is that of Professor James in his "Talks on Psychology."

"Suppose now you appear before the child with a new toy intended as a present for him. No sooner does he see the toy than he seeks to snatch it. You slap the hand; it is withdrawn and the child cries. You then hold up the toy, smiling and saying, 'Beg for it nicely,—so!' The child stops crying, imitates you, receives the toy and

crows with pleasure; and that little cycle of training is complete.

"Now, if the child had no memory, the process would not be educative. No matter how often you came in with a toy, the same series of reactions would fatally occur, each called forth by its own impression: see, snatch; slap, cry; hear, ask; receive, smile. But, with memory there, the child at the very instant of snatching, recalls the rest of the earlier experience, thinks of the slap and the frustration, recollects the begging and the reward, inhibits the snatching impulse, substitutes the 'nice' reaction for it, and gets the toy immediately, by eliminating all the intermediary steps."

This little cycle gives the gist of psychologic will theory. No matter how complex the act, it may be analyzed to the elements here outlined, perception, thought, action, all ultimately reducible to native or instinctive reactions.

II. a) For the sake of studying volition more closely, divide each conscious act into its parts. The following analysis is not intended as an explanation of acts of will, but rather as a form and guide in their observation.

Notice that there are involved in Professor James' example two mental states of chief importance:

1. When the child first saw the toy, the idea in his mind was that of *himself without the toy;*

2. The "conscious purpose," or "recognized inclination" that struggled to displace it was that of *himself as having the toy;*

3. Notice, in the third place, his idea or plan of how to get it: first, to snatch it, and second, after his will was educated, or trained in that particular, to "ask for it nicely."

4. Fourth, the actualization of this plan was an act of will.

b) Now, please go over several of your own acts in the same way. I, for example, just answered the telephone: When I first heard the bell,

1. The idea actually in my mind in reference to the act in question was that of myself as not having answered the bell;

2. The "conscious purpose" of myself as having answered the bell at once struggled towards actualization;

3. I planned quickly in the terms of secondary muscular and visual sensations l) to rise, m) to turn towards the door, n) pass through the hall, o) to go down stairs, p) to stand before the telephone, q) to take the receiver and speak;

4. In the terms of perception, each step of the above series became in turn a part of the outer order until the idea of myself as having answered the telephone was actualized.

c) Another case: I sat still and planned a lesson: When in thinking over the work of the day the idea of my class came,

1. The thought was of myself as not having planned my lesson;

2. The conscious purpose of myself as having planned the lesson at once became impulsive;

3. In my plans for the actualization of this idea l) I thought, I'll sit down and work it out, m) I'll think what we did yesterday, n) and think out a list in order for to-day.

4. Each step of this plan was carried out until the idea of myself as having outlined the lesson was actualized.

d) And just one more: Last summer I took a long journey. I first decided at Easter to go. Then,

1. The idea in my mind in reference to this volition was that of myself as not having spent the summer in travel;

2. The idea that then became impulsive was that of myself as having spent the summer in travel;

3. The fleeting plans that at that moment flashed through my mind were vastly modified and elaborated in the months that followed. I can pick them out quite definitely, however, step by step;

4. Each step was carried out approximately as planned, and by autumn the idea of myself as having taken the long journey was actualized.

In these cases and others the actualization of a conscious purpose is an act of will.

APPLICATION STEP.—I. In Professor James' analysis the child's instincts, or primitive impulses to snatch the toy, to avoid hurt, and to please some one were made over into a reasonable act.

II. Make out a list of instincts in children that become constituents in volition, such as the impulses to creep, to walk, to grasp, to make movements in self-defence, to carry objects to the mouth, to eat, to construct, to imagine, to make sounds, to play, to use the senses, to attract attention, to imitate, to co-operate, to show off, to collect, to fight, to run away; The instincts of curiosity, affection, and its opposites, fears, aggressiveness, freedom, adventure, diffidence, egotism, selfishness, adornment, cruelty, gregariousness, and hundreds more.

Man having had a longer chance at racial development than any other animal, has a greater number of instincts, consequently his volitional life is correspondingly complex.

All impulses become co-ordinated into muscular acts where control and skill make a profound difference in capability and strength of volition.

III. "Although we readily recognize and admit the volitional processes in childhood are, in their origin, de-

pendent upon impulses, it is not so obvious that adult conduct is in the same manner bound up with impulse. Nevertheless, this is the fact * * *. Indeed, the statement is often made that the *development of volition* is neither more nor less than a process of *reducing our impulses to order,* and that a mature character is simply one in which the impulses are thus subordinated to some systematised principles. Instead, therefore, of the conception that a developed will or character is one in which all primitive impulses have been extirpated or repressed, we have the conception of *these impulses as continuously operative, but operative in a rational and coherent way,* rather than in the chaotic fashion characterizing childhood and infancy. This view is unquestionably correct in its general implications * * *." ("Psychology," James Rowland Angell.)

The italics are mine. "The development of volition is * * * a process of reducing our impulses to order." To say that only rational acts are volitional sounds arbitrary, yet it seems to describe the case. To a reasonable being an idea becomes impulsive when it is seen to be the reasonable, right, wise, noble, or good thing to be done.

IV. But, you will ask, what about the unreasonable, the foolish and wrong things we do, are they not acts of will?

To answer the question, study these acts concretely. Is not each done as the result of a hasty, thoughtless impulse, or of ignorance, or because you are the slave of a bad habit? All these acts are far from the actualization of reasonable conscious purposes, therefore they are not volitional but they are done because of the absence of volition.

Yet even these acts are to be reckoned with in the study of will since they are parts of the stream of thought that influence later plans and volitions.

V. "Rationality—morality—freedom—firmness of character, are apprehensions of the same notion from different sides. He who acts rationally acts morally; for the content of reason is the demands of the moral law; he is also free in his action, because he determines himself, not in accordance with the momentary state of his consciousness, which is inclined to favor now this, now that desire, but according to the unchanging demands of his rational insight * * *. By thus freeing his volition from all accidental vacillations, he acts consistently; i.e. as having character." ("Empirical Psychology," G. A. Lindner.)

LESSON II

FEELINGS

PREPARATION STEP.—I. Kindly make the following experiment: Read something thrilling, such as one of Poe's tales of horror and mystery or Mrs. Shelley's "Frankinstein." As you read, notice the changes in the circulation of the blood as shown by your pulse and heart beats; changes in the color of your face; in the size of the pupils of your eyes; in breathing, temperature, and digestion; in the secretion of sweat and saliva; in muscles.

II. Observe the bodily accompaniments of fear: They are pallor and trembling, spasm of the heart, effects on the abdominal viscera, goose-flesh on the skin, cold sweat, bristling of the hair, dryness of the mouth, choking, paralysis of the voice or hoarse screaming, tendency to flight, sensations of weakness.

The bodily accompaniments of pleasure are general expansiveness, sparkling eyes, flushing face, bodily warmth, deep breathing, smiling, rounded face, and other external movements.

III. Recall instances from history, fiction, and poetry of primitive rage, love, hate, of passionate devotion to a cause, an ideal, the accomplishment of a purpose. Compare your own emotions with these as to strength and spontaneity; your own now with those you had in childhood.

Wherein lay the power of Paul, Luther, Pestalozzi, Jean d'Arc, King Arthur, Keats?

IV. To the critical observer of the growth of a child the emotional life more than any other phase of mentality proclaims the great diversity of personalities in the same individual as development progresses, often in jerks and leaps, through the different strata of racial life. In these multiplex personalities "the voices of extinct generations, sometimes still and small, sometimes strident and shrill" reverberate until increasing mental unity brings relative maturity. Thus, not only is the intellectual and volitional life made out of instincts, but also the emotional life.

V. In the first lesson only completed acts were studied. Suppose, now, that in some way I had been hindered from answering the telephone, or that I had been prevented from going abroad: how should I have felt about it? My feeling would have been one of disappointment in both cases—of great disappointment in the second. But I was not hindered in either act, and I enjoyed actualization in both.

VI. Think over again the many little acts that have made your day. Suppose, instead of having been able to do each one in a capable and efficient manner, you had been hindered and thwarted at every turn, should you have had a happy day?

On the other hand, everything went as you had planned, and you feel pleased and satisfied. Some of the acts, like answering the telephone, seem trivial—there was no great pleasure accompanying the realization here of the con-

scious purpose. Still, if one imagines a hindrance to actualization, there is discernible a distinct feeling of annoyance.

All feeling seems to be, not absolute, but relative. Yet one can realize that a feeling is relatively pleasurable sometimes only by supposing the opposite condition, a hindrance to actualization, when the disappointment resulting shows that actualization was relatively pleasurable.

VII. Make out a list of feelings that you have experienced. Notice that, though your list contains many different names, all the feelings may be classified as either pleasurable or painful. Classify them in these two divisions.

VIII. How definitely can you plan and act under strong emotions? How accurate a description can you give of such an event as, say, your wedding, the burning of your home? What effect on one's sanity and self-control does great joy or sorrow have?

PRESENTATION STEP.—I. Any discriminated result in mind of a change in the cebrebral terminals of the sensory nerves is a sensation. It has a presentative element—is red or smooth or musical or sour or loud. Feeling, on the other hand, has no content, it is simply the pleasure or pain that goes along with, or attends mental action.

The accompaniment of mental action then is feeling, painful when there is a hindrance, an obstruction, or thwarting,—pleasurable when there is a furtherance of interests or intentions.

II. As to the bodily conditions from which feelings result:

Sensations, as those of color, are the result of change in a particular part of the cerebral cortex. The geography of the brain has been tentatively mapped out to quite a

degree for areas whose stimulus results in sensations and muscular action. And even though they have no definite content and brain localization, feelings, as well as sensations, are thought to be results of bodily condition. Thus we are pleased because we smile, expand the muscles generally; because we weep, actually or incipiently, we are sad. "Can one fancy the state of rage and picture no ebullition in the chest, no clenching of the teeth, no impulse to vigorous action, but in their stead limp muscles, calm breathing, and a placid face? The present writer for one, certainly cannot. The rage is as completely evaporated as the sensation of its so-called manifestations, and the only thing that can possibly be supposed to take its place is some cold-blooded and dispassionate judicial sentence, confined entirely to the intellectual realm, to the effect that a certain person or persons merit chastisement for their sins,* * *. A purely disembodied human emotion is a nonentity." (W. James, "Psychology.")

"The bodily changes follow directly the perception of the exciting fact, and * * * our feeling of the same changes as they occur is the emotion." (Ibid.)

This peculiar accompaniment then of mental action, feeling, is a mental resultant (like sensations, but, unlike them undiscriminated) of all elements of the bodily condition.

III. There is always an emotional accompaniment in the stream of thought, and its nature depends on the mental content that is passing through the mind. Where the content is relatively simple and primitive the feelings are instinctive and generic (The mental content of ideas of danger, a hindrance to self-preservation, is accompanied by the feeling of fear).

Where, on the other hand, the stream of thought is informed, reasonable, sane, the emotions are relatively com-

plex. (As feelings of enjoyment of one's work, the accompaniment of a furtherance of one's ideas of well-being.)

IV. Study many concrete feelings both as the accompaniment of hindrance and furtherance of volitions and at the same time the resultant of the general bodily condition.

APPLICATION STEP.—I. If one thinks away all the bodily conditions of fear, there is no fear left. Is there not a hint here for the positive cultivation of bravery, good nature, kindliness, optimism, and other virtues through the persistent assumption of their bodily conditions and attitudes?

Take the case of bravery: the presence of an emotion is so noticeably upsetting to reasonable control that it, emotion, is even explained by Dewey and Angell as "the temporary suspension of voluntary control in the forward movement of consciousness." If, then in the first consciousness that one's house is afire, instead of "losing one's head," he could "keep his wits about him," or could "collect himself" by controlling the bodily manifestations, while he reasons what to do, mightn't the timid really become quite brave? There seems, indeed, to be something in "putting on a bold front" and "whistling to keep your courage up."

Psychologists say that policemen, firemen, and soldiers realize dangerous and terrifying conditions, yet because they apprehend them in a cold-blooded and self-controlled way, they do not feel fear.

II. If only reasonable acts are volitional and if the furtherance of these is always pleasurable, then is not duty always pleasurable? This question sounds, perhaps, like cant, yet it really involves a profound scientific truth, namely, that reasonable acts are always ultimately pleasurable. Why not make the most of the truth, then? One

misses so much through overestimation of what one has done, through loving to be a martyr and miserable! Why not realize life as the abounding joy that it is?

Stevenson said, "I know what pleasure is, for I have done good work."

"Duty * * * is not adequately conceived and felt if it is not pleasure." (G. S. Hall.)

III. But even in the most healthy and reasonably controlled individuals, there appear sometimes the native instinctive impulses, feelings that in spite of high ideals are reversions to the blind, unreasoning joys and sorrows of primitive life. There are cases in which these feelings are not weakening, but, in general, "character forming is the process of reducing impulses to order."

In application of the last statement, it is interesting to note the following definition of immoral literature given by Mary Wood-Allen: "Immoral literature is any literature which depicts love as a feverish, irresponsible passion, that comes we know not whence, and carries us we know not whither, but that must be followed wherever it leads." And from G. S. Hall, "In six leading contemporary alienists I find the following definitions of love as described in novels: Emotive delusion, fixed idea, rudimentary paranoia, psychic neurasthenia, psychic emotive obsession and episodic symptoms of hereditary degeneracy."

IV. Why should one have strong feelings? Have you strong interests? What are they? Test each ruthlessly by the amount of money, time, and effort you spend on it.

Education has been defined as a process of starting interests. This aim is certainly a good "working" one for teachers, for whatever education is, it is not finished at the end of school-life.

And yet what in general has been the effect of education, cultivation on strength of emotions? "In our day and

civilization" writes Dr. Hall, "the hot life of feeling is remote and decadent * * *. The very word passion is becoming obsolete in psychological literature * * *. The life of feeling has its prime in youth, and we are prematurely old and too often servile in heart * * *. Our sensibilities are refined, but our perspective is narrow * * * our very philosophy as well as our religion * * * looks with some contempt upon enthusiasm. Our sentiments are oversubtilized and sophisticated and reduced to puny reactions to music and appreciation of art that are nine parts criticism and one part appreciation. What we have felt is second-hand, bookish, shop-worn, and the heart is parched and bankrupt."

But in the souls of children and adolescents we are ever rejuvenated emotionally. "Their hearts are young, fresh, and in the golden age. There is color in their souls, brilliant, livid, loud. They are still the light and hope of the world."

LESSON III

DESIRES

PREPARATION STEP.—I. Why do we not all have the same desires?

What one desires in each case is the purpose in an act of will, the impulsive mental state. The question then comes back to the one considered from the standpoint of Apperception, under what circumstances could two persons have the same thought? It is because each one's present stream of thought is made by the rearrangement of his secondary experience, by his past, that no two persons can have just the same desires. See how important memory is in the matter.

II. What makes a mental state impulsive?

A mental state becomes impulsive as soon as it is seen to be the reasonable, right thing to do. Notice, in passing, how acute and subtle one's consciousness, or conscience, comes by experience to be in the distinction between reasonable and foolish things, between right and wrong.

III. What have you desired to do recently? I desired to go to a committee meeting this morning; to make some visits this afternoon; to read a newspaper to-night; to hear a person sing to-morrow, and many other things.

Did you ever when you were a child, desire to reach the moon? Think over other desires that you have had, those that have come to you in day-dreams, such as to be rich, happy, beloved, beautiful, wise, clever, famous, good, well, to rest, to be frivolous. What are you doing to make these desires come true?

Notice that some of your desires are realized at once, some last a long, long time.

IV. Surely no one enjoys a visit to the dentist's chair, yet you go there even when you are not actually suffering from toothache if you know that you should go. That is, brought up as you have been, you could not stay away with any ultimate comfort.

Think of other cases where you do not enjoy the process of actualization in itself, yet where without actualization there would be no real satisfaction.

V. The analysis here attempted is not intended as an explanation of desire,—it is hoped only that the classification of parts outlined will stimulate to more constant observation of the stream of thought from the standpoints of desire, will, and feeling.

PRESENTATION STEP.—I. The analysis of my desire to attend a committee meeting this morning shows it to have

been composed of these parts: When four days ago I received a notice of the meeting.

1) The idea in my mind in reference to the act was that of myself as not having attended the meeting this morning;

2) The idea of myself as having attended the meeting became impulsive;

3) My plans at that time were a) fleeting thoughts of how I should place the notice in sight on my table so as not to forget it; b) thoughts of arranging my work for to-day so as to finish it by eleven o'clock; c) thoughts of myself as walking to the meeting;

4) Before I carried out my plans and finally attended the meeting, that is, while I desired to go, my feeling was relatively painful;

5) If two days ago I had become convinced that I could not go to the meeting because of extra work, though much disappointed, I should have ceased all effort toward going. If, again, my belief in my ability to go had been restored, I should have continued to make an effort to go. When I believed the end to be unattainable, I should still have had a "vain wish" to go, as business of importance to me was to be transacted.

II. The general condition of struggle, preceding volition and including,

1. The idea in consciousness of myself in reference to that act,

2. The impulsive idea,

3. The plans,

4. The relatively painful feeling, and

5. The belief in the attainability of the end,—the general condition of struggle including all these makes desire.

III. Accustom yourself to the constant observation and analysis of concrete desires.

APPLICATION STEP.—I. According to the definition given, the term desire includes both more and less of our experience than is commonly included in it. It includes more in that what precedes all the little trivial acts of will as well as the important ones must be desire. Our days seem to be made up of one conscious actualization after another, so that we have many desires every day.

The term desire includes less than is ordinarily thought in another sense. Do you ever desire to do what is not reasonable, wise, or right? At first thought it seems as though you do, yet when you have watched yourself for awhile, I think you will have to agree that desire must be limited to the striving for reasonable, right things, alone. The foolish or wrong impulses come only when one does not give the right desires a chance. These impulses come because we are the slave of a habit, a "lower motive," or are ignorant.

This distinction, that we desire to do only the right thing, follows from the psychological idea of volition, "the process of reducing our impulses to order." The craving unrest of desire is always for what will give one pleasurable satisfaction ultimately, and, to a reasonable and sane person no matter how painful the process may be, only the actualization of what is reasonable and sane will ever do so. The ethical implications and applications of such a conception for purposes of actual living are tremendous.

Thus the meaning of the term desire in connection with volition is seen to be not so broad as its ordinary use would justify.

II. Did you ever desire to go to the moon? I know a child who did, who used actually to plan how she would make the journey. When, as she grew older, she realized

that the end in her desire was unattainable, she still had left a "vain wish," she often dwelt upon how nice it would be to go, but all effort to reach the moon ceased.

Thus, when one's belief in the attainability of an end is destroyed, there may remain a mere "vain wish," but desire is ended. The test of desire is always the struggle, the effort, what one does to further actualization.

Perhaps, however, "vain wishes" still have a place—they are "the stuff that dreams are made of," and what should we be without dreams? To be sure their pleasures are not very keen, "they who do but shadows kiss" have "but a shadow's bliss." Yet, how often have the "vain wishes" proved profoundly suggestive in plans and execution as well as in ideals themselves!

One would not, however, hold up as a model the type of character that lives habitually in "vain wishes," in a general sentimentality, ineffectiveness, any more than one would admire him who has the "weeping-over-spilt-milk" attitude,—both types incapable of any vigorous accomplishment. "In willing we work, but wishes play with us."

III. Why does one like to be thought to have strong desires? What difference would it make if people had a greater number of desires than they have? What difference, if one thought, imagined, and imaged more vividly and definitely in connection with ideals, even the most trivial, and plans for their realization?

IV. "* * * desire occupies an extremely fundamental position in the development of will and the formation of character. In the first place, the actual psychical condition presented by desire affords us a striking instance of the great salient features of the mind with which all our previous study has been concerned. In it we find elaborate thought processes at work; we find conspicuous affective

factors and we see the whole onward moving conative character of consciousness brought clearly to light. Moreover, it discloses to us an epitome of the character at any given moment." (J. R. Angell, "Psychology.")

V. Some observation is necessary to enable one to realize the force of belief in connection with desires and volition. Professor Abby Leach in an address before the Association of Collegiate Alumnae recently showed strikingly the difference between knowledge that does not bring conviction and that which does in effectiveness. She said:

"We have seen in the Japanese-Russian war a heroism in answer to the call of duty that has never been surpassed in all history. We have seen * * * the words 'It is sweet to die for one's country' suddenly transformed from mere fine phraseology into the animating principle of men's lives * * *. We have seen patient thought applied to every detail, however small, and we have seen on a scale never seen before, human foresight and effort so directed by the keenest intelligence that the incalculable element of chance hardly counted in the issue. What was the secret of it all? Do we need to ask? Is it not because the Japanese believe what they profess? believe so profoundly that they do the thing? Wounds are often dangerous on the battlefield because some shred of soiled clothing is carried to the wound with the bullet, and so—a bath and clean clothing before the battle. Did we not know this in the Cuban war as well as they? Did we do it? Knowledge transmuted into belief, that is a force that is irresistible and that to my thinking is what the Japanese have and we lack. They are trained so that they believe what they learn, they live what they believe. In them we see the power of ideals, for the nation has grown great because of its profound conviction of some of the fundamental truths of life.

"No matter how sound the principles taught, how correct the moral standards, how profound the truths, education has failed of its purpose unless it can make these part and parcel of the life, ineradicable beliefs that no influence from without or temptation from within can move in the slightest, beliefs that with the coming and going of the days and the chances and changes of life but take the deeper root, but gain in strength and beauty. For education is not the learning of tables of weights and measures but the study of values and standards and such complete acceptance of these that the life is affected thereby."

VI. President Butler recently emphasized the importance of careful attention on the part of schools to the instillation of right principles:

"Put bluntly, the situation which confronts Americans to-day is due to lack of moral principle. New statutes may be needed, but statutes will not put moral principle where it does not exist. The greed for gain and the greed for power have blinded men to the time-old distinction between right and wrong. Both among business men and at the bar are to be found advisers, counted shrewd and successful, who have substituted the penal code for the moral law as the standard of conduct. Right and wrong have given way to the subtler distinction between legal, not-illegal and illegal, or better, perhaps, between honest, law-honest and dishonest."

Dr. G. S. Hall, also, points out the difference between mere superficial, formal knowing and doing:

"* * * the intellect may be so trained as to enfeeble and dissipate the will, and it is because this is so widely seen and felt that it has come to be one of the chief endeavors of educational thought to-day to go deeper and to moralize as well as to mentalize children and to develop will as a chief factor of character."

And President Briggs in "Routine and Ideals"[1] makes clear the truth that life is an educational process; its end is not to present the greatest number of ideals to a man, but to pass the greatest number of ideals into him; to make his visions authoritative in his life by transmuting his ideals from the realm of dreams into the realm of character.

LESSON IV

CHARACTER

PREPARATION STEP.—I. A mother recently told me of her little son aged eight to whom she had related stories of the training of a page as set forth in the tales of chivalry. The child immediately became her page and asked often about what pages did. Where formerly she had to say, "Elton, please open the door for me," she now finds that Elton runs to open the door when he sees her rise to leave the room. Where he formerly needed to be requested not to slam the door, now he remembers to close it gently without such reminder. And she is finding that the ideal makes him not only much more positive in his thoughtfulness and foresight for her and his sister, more gentle in his ways about the home, but also more conscientious and responsible in his tasks in school.

A certain "fourth grade had shown a degree of restiveness which was at once despair for the practice teachers and interesting study for the teacher of psychology * * *. Influence after influence was tried with very little result. At last it was determined to ask a new teacher * * * to tell the children the Arthurian stories, and let them live the Arthurian life as far as possible * * *. Very soon it was found that all the Arthurian literature in the libraries * * * was not

sufficient to meet the demands of the children and practice teachers. Another large library was called upon and generously lent its resources. A jousting-place appeared on the playground, and was rarely without contending knights in the hours given to play. Helmets, shields, spears, swords, lances, and Arthurian costumes for both sexes were soon in process of manufacture not only in the shop and the schoolroom, but in the homes of the children. Each boy in the grade assumed the name of one of Arthur's knights, and agreed to try to imitate his life and to gain his character. Each girl became a lady of Arthur's court and was shortly acting well her part. No observer could doubt the value of the result. A noisy and restless school became orderly and obedient. Courtesy took the place of self-assertion on the playground, and evidence was obtained that many of the children were carrying the new spirit into the home conduct. 'That is unknightly' became a strong deterrent; and * * * the transformation was lasting." ("The Elementary School Teacher," Vol. VI, No. 3, p. 137.)

In a certain school where the children lived through different race periods, a visitor to the Roman room noticed on the board the words, "Power through law," the ethical core of study for the grade. The very atmosphere of the room seemed full of the stern integrity and self-control for which the word Roman stands to us. And both in this room and in the Greek one before it, the children seemed really to have lived through something of the "Glory that was Greece and the grandeur that was Rome."

"The old traveler, Rafinesque, tells us that, when he was a boy he read the voyages of Captain Cook and Pallas and Le Vaillant, and his soul was fired with the desire to be a great traveler like them. 'And so I became such,' he adds shortly."

Lincoln after reading Weems' "Life of Washington" declared, "I do not always intend to delve, grub, shock corn, split rails, and the like."

"Nurture your minds with great thoughts. To believe in the heroic makes heroes." Inspire a child with an ideal and he will take care of his own education, advancement in life, and character.

II. Though at first all mental states are instinctively impulsive, education soon begins to effect the inhibition of undesirable impulses and the substitution of ideas of wise action. Thus, in the analysis of acts of will, one finds each time one purpose, or end that is impulsive, that is seeking actualization. It is in every case the idea of what is the expedient, wise, reasonable, right thing to be done, a resultant of individual experience as well as hereditary and racial influences.

What effect would ignorance of factors involved in an act have on the definiteness and adequacy of this ideal purpose? When the little chap of the first instance did not know about the duties of a page, he did not have in many trains of association the ideal purposes of gentle manners and conscientiousness. Even though he had been told the generalizations, "Be courteous, do well in school," he did not really know them, he did not have a "working idea" of them as he did when he lived freely and completely the life of a page.

Study most carefully the relation in your own experience between knowing and doing. There are those who go even so far as to say that "adequate knowing is doing."

III. What difference does your condition of health make in your alertness, effectiveness, and capability? In your relations to other people in helpfulness? The final estimate of character seems to be a matter of contacts with other people.

Think back over your own experience to discover the difference that physical movement and muscular co-ordination have made in mental and volitional skill, confidence, and efficiency. Science says that through infancy and childhood, at least, the development of the two factors, physical and mental, go hand in hand.

It is said of young Americans that most of them have not even a rudimentary conscience in regard to care of the health, bodily development, and intelligent physical training. Another factor of importance in the estimate of the value of a life is the length of its period of usefulness.

In Germany military training is developing a nation of men of strong and vigorous physique; agile, plastic, and alert; enured to Spartan simplicity of life and to hardships; trained to obedience and inoculated with the soldier's virtue of loyalty and self-sacrifice. Yet one would not for a moment desire conscription and universal military training for American youth. One would desire, however, a more serious realization of the vast importance of physical training to secure health, vigor, and will potential.

"The great increase of city and sedentary life has been far too sudden for the human body—which was developed by hunting, war, agriculture, and the manifold industries now given over to steam and machinery—to adapt itself healthfully or naturally to its new environment * * * reflect what movements we habitually make each day, and realize how disproportionately our activities are distributed compared with the size or importance of the muscles, and how greatly modern specialization of work has deformed our bodies. The muscles that move the scribbling pen are an insignificant fraction of those in the whole body, and those that wag the tongue and adjust the larynx are also comparatively few and small * * * it is disastrous to concentrate education upon them too exclusively or too

early in life." (G. S. Hall, "Moral Education and Will Training.")

PRESENTATION STEP.—There are two factors to be reckoned with in considering the science of character; one is the presence of effective ideals, the other, such a physical condition and development as make their actualization possible.

I. In regard to ideals:

The individual at each moment, the sum of all his past, is his character. If character were something uninfluenced by thought and experience or something separate from the individual, training would not be possible. But action is at least sometimes influenced by knowledge, and thus the character is educable.

If at a given time the individual's act is reasonable, completely adapted to his condition and time, then his is to that extent a good character. In proportion as the sum of his acts is invariably reasonable, he may be said to be educated, morally trained.

Reasonable will acts, then, are good character. Since the will at each moment is not something wholly independent of everything else, but is one aspect of the stream of thought at that time, the thoughts are an important consideration. If the thoughts are of the right kind, acts are more likely to be so, but if they are not, action will be faulty.

But a completely fashioned will is not something that comes by accident. The problem for teachers then is how to furnish a child in school with a mental content by which he will be educated, morally trained.

As a child is trained at present by the public schools, his stream of thought is almost empty of ideas that give a positive quality to his acts. The study of children would seem

to indicate that their wrong-doing is largely due to their ignorance as well as to lack of tact on the part of parents and teachers. Their native impulses, moreover, are neglected or perverted instead of made into motives reasonable for their years. The formal maxims that a child has been given, like, Do not lie, Always do right, since psychologically he is incapable of any wide application of generalizations, do not always come when they are needed to save him from wrong-doing. If then instead of general and haphazard directions he could be given an adequate knowledge of a large number of concrete, intelligible ideals of conduct suited to his years, if his stream of thought could be filled with a wealth of motive forming material, the spontaneous product of his instincts he would come much nearer to being the positive, self-directed, responsible human being that his age, not an adult's but a child's, requires.

II. As to the relation of muscular training to will,

"Muscles are in a most intimate and peculiar sense the organs of the will. They have built all roads, cities and machines in the world, written all the books, spoken all the words, and, in fact, done everything that man has accomplished with matter. If they are undeveloped or grow relaxed and flabby, the dreadful chasm between good intentions and their executions is liable to appear and widen. Character might be in a sense defined as a plexus of motor habits. To call conduct three-fourths of life, with Matthew Arnold; to describe man as one-third intellect and two-thirds will, with Schopenhauer; to urge that man is what he does or that he is the sum of his movements, with F. N. Robertson; that character is simply muscle habits, with Maudsley; that the age of art is now slowly superseding the age of science, and that the artist will drive out the professor; that history is conscious-willed movements; to hold that most thought involves change of

muscle tension as more or less integral to it—all this shows how we have modified the antique Ciceronian conception *vivere est cogitari* to *vivere est velle,* and gives us a new sense of the importance of muscular development." (A. W. Trettien in *American Education.*)

"The trouble is that few realize what physical vigor is in man or woman, *or how dangerously near weakness often is to wickedness,* how impossible healthful energy of will is without strong muscles which are its organ, or how endurance and self-control, no less than great achievement, depend on muscle-habits. Both in Germany and Greece a golden age of letters was preceded, by about a generation, by a golden age of national gymnastic enthusiasm which constitutes, especially in the former country, one of the most unique and suggestive chapters in the history of pedagogy. Symmetry and grace, hardihood and courage, the power to do everything that the human body can do with and without all conceivable apparatus, instruments and even tools, are culture ideals that in Greece, Rome and Germany respectively have influenced, as they might again influence, young men as intellectual ideals never can do save in a select few * * *. Even will-training does not reach its end till it leads the young up to taking an intelligent, serious and life-long interest in their own physical culture and development." (G. S. Hall, "Pedagogical Seminary," Vol. II, 1892.)

APPLICATION STEP.—I. Many schools in Germany and an increasingly large number in this country are taking advantage for character training of the child's native impulses by causing him to live through in the grades the best in successive periods of race development. For genetic psychology teaches that the individual recapitulates the periods of race development, and its ideal has never been better

formulated than in Goethe's words, "The youth must always begin anew and as an individual traverse the epochs of the world's culture * * *. One could be genuinely aesthetic-didactic if he could pass with his pupils before all that is worth feeling, or if he could bring it before them exactly at the moment in which it culminates and when they are most highly sensitive." And, "Sin," says Dr. Balliet, "in all its forms is but little else than an arrest of ancestral instincts on their primitive plane. *The child must live through the lower stages successfully* if it would arrive at the highest."

In some American schools children of six are led to live for a few months through a period of primitive life,—really to live not simply to read it, or to study about it as they do in formal school courses. A boy in one of these schools lives through the hunter period, represented, perhaps, by Indian life with Hiawatha for his hero. He wants to be just like his hero, brave not foolhardy, uncomplaining, truthful, and to feel a kinship with plant and animal life. His concrete ideal comes to him in many associations to show him how to act. The thought, "If I lie, the teacher will punish me" may come to mind when needed to hinder a lie, but if he is sure she will not find it out, he is likely to lie with impunity. Compare this last motive with the motive furnished by the Hiawatha ideal, "Hiawatha always told the truth. I want to be just like him," as to which is the more adequate, lasting, and worthy.

Later the boy, while he is recapitulating their epoch, lives freely through other typical periods of primitive and historic life: after the hunter period, the nomadic period, taking the Aryan boy for a type with his native myths of "Cinderella," "Jack and the Beanstalk," "Jack the Giant Killer;" the soldier period of the Persian boy, and all the other successive periods of Greece, Rome, chivalry, the

Renaissance, and Puritan and modern history, with all their wealth of suggestion for literature, sciences, art, formal studies, and bodily training.

Think of a public school course so planned that the children live, as I have seen them do, through a large number of periods and lofty ideals chosen thus from history and the literature of power. How inestimable a wealth of motives is the result! Given such a content there is something to which to appeal when a child does make mistakes or misjudgments. Now a direction or suggestion as to conduct finds few relations in the mind of the average school child—he obeys a direction to please the teacher, perhaps, but his conduct in general has not that initiative quality that comes from knowing the best, from a complete familiarity, saturation even with a concrete ideal adequate to all the needs of his age, individual and social.

And try to realize, also, the gain in character that results to the children from loving their work, from the spontaneity of their effort, and from all the richness, happiness, grace, and charm that belong to such a school life,—thus led the children, indeed, "have life more abundantly."

The caustic critic's phrase, the "flabby goodness of imitation or the hysteric virtue of suggestion" does not at all fit the conduct of one whose heart is thus filled with high ideals, for, as he has advanced from year to year through the changing race ideals, ideals always the creation of his spontaneous instincts and interests as his life recapitulates the periods, an accumulation for will, a habit of living, a "second nature," and a "higher heredity of wisdom and virtue" have been built up which are the highest type of morally trained character.

II. So much for the suggestions of psychology for schools; now as to a few matters practical in will-training for the individual:

Is it possible and advantageous to make quick, and at the same time, wise decisions? Can you train yourself to this habit in any way? Study different people for differences in decision, firmness, thoroughness, self-reliance, responsibility in improving opportunities, capacity for sustained effort, and the attitude toward discouragements.

"* * * if there is any one thing of which our industries and practical arts are in more crying need than another, it is the old-fashioned virtue of thoroughness, of a kind and degree which does not address merely the eye, is not limited by the letter of a contract, but which has some regard for its products for their own sake, and some sense for the future. Whether in science, philosophy, morals, or business, the fields for long-ranged cumulative efforts are wider, more numerous, and far more needy than in the days when it was the fashion for men contentedly to concentrate themselves to one vocation." (G. S. Hall.)

"It is not book-learning young men need, nor instruction about this and that, but a stiffening of the vertebrae, which will cause them to be loyal to a trust, to act promptly, concentrate their energies, do the thing." (No. 25, *Four-Track Series.*)

"Energy of will * * * can only gradually be developed by means of persistent actual will-attempts and will-actions * * *. An Argonautic expedition, a lion hunt in Central Africa, the ascent of the Gross Glockner, a north pole expedition—all these are executed, but the preservation of untarnished honor and of clear conscience upon the Argonautic Journey of human life is a task which summons up the full will-power of man." (G. A. Lindner, "Empirical Psychology.")

In training the will in connection with the small duties of daily life, an important consideration is the beginning places,—it is easy enough to do things when one is once

started. With an understanding of this difficulty, one can go about its correction intelligently. Practice, then, "instant actualization." One does not need to make up artificial conditions to train the will here, for surely every one has daily and hourly opportunity to overcome procrastination. Of all subtle sappers of strength of will, this one is perhaps the subtlest as well as the most fundamental.

It is necessary, however, to observe a few cautions in the practice of "instant actualization." One is, remember that the impulsive idea is always an idea of the wise thing to be done—hurried action, then, is not possible. Nor is it possible to be nervous, fussy, over-alert, or over-exacting with one's self or others. A morbid attitude toward life is always to be avoided, such an attitude as sometimes drives one, though already fagged, to continue work, when the only reasonable thing to do is to relax. So few people in mature life who are "bearing the burden and heat of the day" know how and when to relax, to rest! Which is worse, to take one's self too seriously or not seriously enough?

To one who, through formalism and familiarity with platitudes, has become lukewarm and lackadaisical in the practice of the homely virtues of the will, there sometimes comes something of renewed inspiration, stimulus, and enthusiasm in the comprehension of conduct as a science, in the realization that here as inevitably as in chemistry do results follow causes, that not only all laxness but all effort as well counts. Whether one thing or another is done, it will not indeed "all be the same in a hundred years."

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